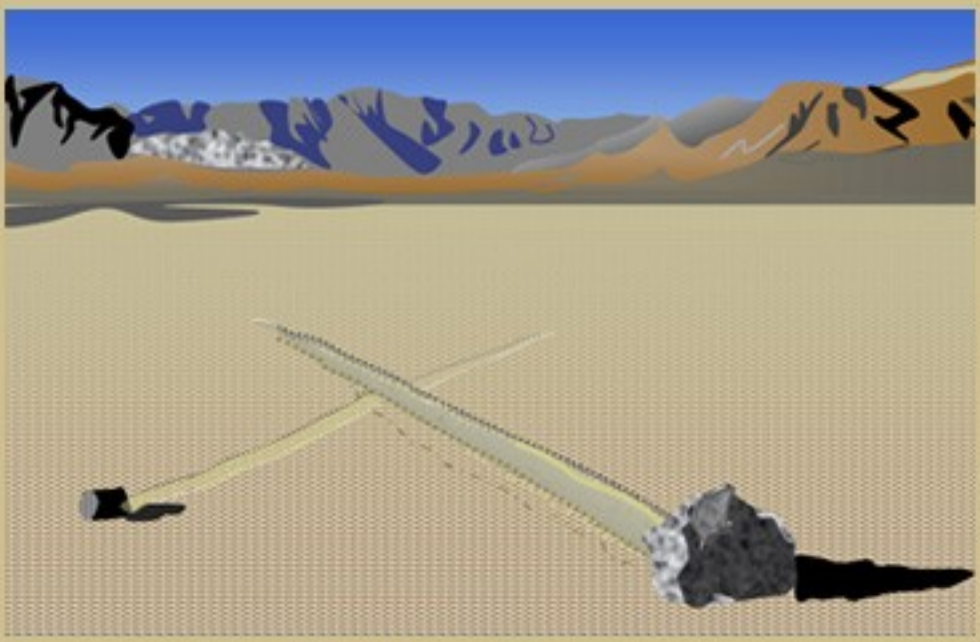
BRAINTEASERS

from the

MOJAVE DESERT



by William Armstrong

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The Mojave Desert references in this book are believed to be accurate restatements of desert lore and personal experiences. The puzzles themselves are entirely fictional (with the exception of puzzle 106 The Sailing Stones).

Brainteasers from the Mojave Desert
Puzzles. 793.73

The following people deserve special thanks for helping the author complete this work:

John Armstrong, Richard Price, Lucia Vera, Mitch Becker, and Sylvia Armstrong.

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Introduction

The Mojave Desert stretches from the San Andreas Fault to the Grand Canyon; from Interstate 10 to Area 51; from Los Angeles County to St. George, Utah; from Death Valley to Joshua Tree National Park. It is said to be the driest desert in North America, and yet it contains Lake Mead, Lake Mohave, and Lake Havasu along the Colorado River. It is crossed by three major aqueducts and by historic Route 66. Its history is a diverse mix of prospectors, aerospace experts, rattlesnakes, Serrano Native Americans, Las Vegas gamblers, and much more.

The arid plains of the Mojave are fertile ground for puzzles. The pages of this book contain brainteasers, riddles, and other puzzles inspired by and created in this famous desert. The challenges are grouped into categories more or less ordered from easiest to hardest:

Tumbleweeds – Lightweight puzzles you should probably blow through, but watch out for the stickers!
Mirages – What you see may not be what you get. Don't be tricked into a wrong conclusion.
Miner Problems – Prospecting for treasure can be dangerous, but the rewards can be spectacular.
Rattlers – Your mind can get a little rattled. Just remember: the rattling warns you to be extra careful.
Test flights – Experimental aircraft are a real test of a pilot's skill. See what you can do with these puzzles.

But who knows? You may find the Rattlers easier than the Tumbleweeds.

Most puzzles have hints, and all of them have solutions. Check out the hints section before you resort to the solutions. And don't limit yourself to our answers; feel free to come up with even better solutions of your own.

Each puzzle in the book has a title followed by a reference tying it to some aspect of the Mojave Desert. For example, here is a heading from puzzle number 5:

5. Constellation Connecting Saddleback Butte SP

Saddleback Butte State Park is high ground in the high desert of Southern California....

Sometimes the connection to the desert is obvious. Other times it is more obscure, even far-fetched. On rare occasions the reference will even help you solve the puzzle, but don't count on it.

Part 1: Tumbleweeds

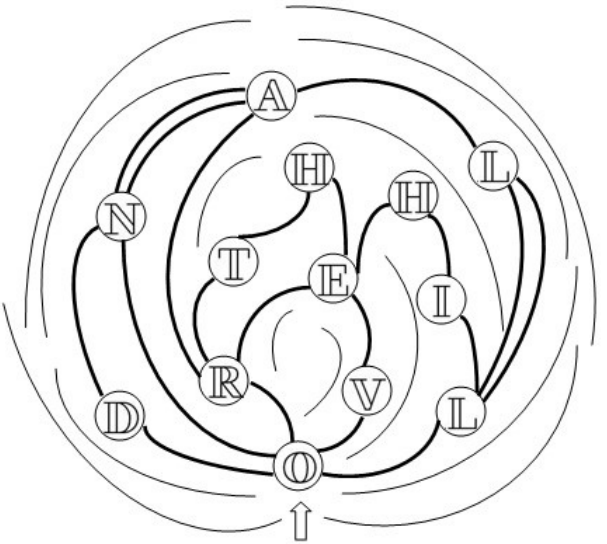
Tumbleweeds blow lazily across desert scenes in Western movies, but what are they really? They begin as Russian thistle or similar annual plants that break off from the root and stem when they die. They are fragile balls that roll along with the wind, spreading their seeds until they hit something hard. They are not hard themselves; that is why this first group of brainteasers is called tumbleweeds.

1. Tumbleweed

Mayflower Gardens Retirement Community

Bill is the hard-working librarian and live wire at his retirement community. Perhaps he owes his longevity and energy to the easy-going attitude he brings to everything he does. Like a tumbleweed, he just keeps on rolling.

Starting with letter "O" (bottom center), travel on each heavy line segment exactly once to spell out the name of Bob Phillips' joke book covering the senior side of life.



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These blanks will show you the spacing between words in the title of Bob Phillips' joke book.

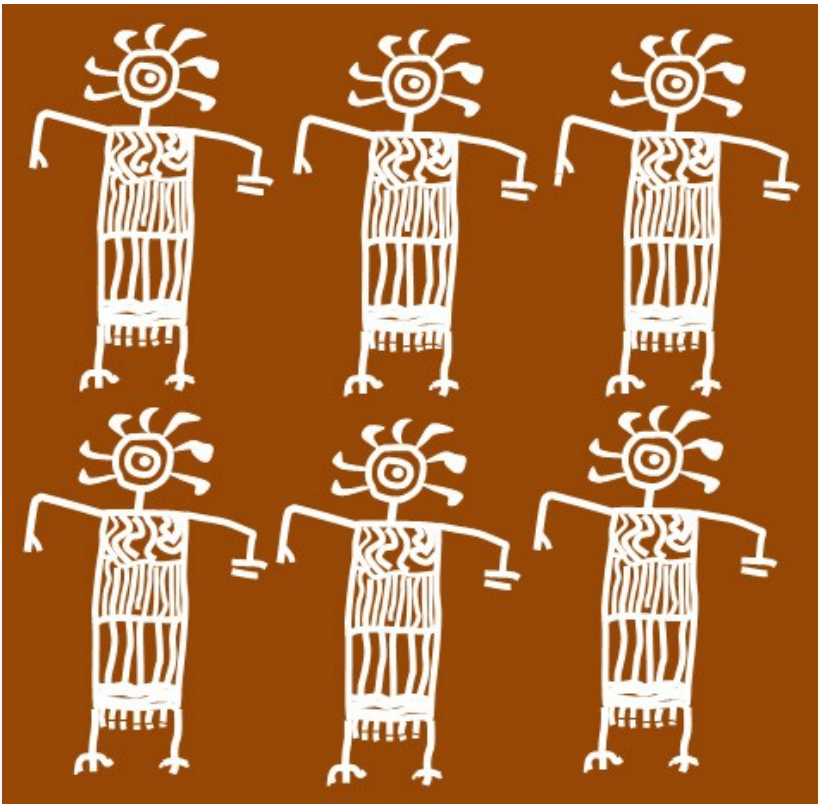
Hint: p. 119 Answer: p. 147

2. Find the Twins

Naval Air Weapons Station, China Lake

The largest and best-preserved concentration of Native American rock art in the country is located on the Naval Air Weapons Station, China Lake. Petroglyphs were carved into the rock by the Coso native people or their ancestors. Some of the art may date back 12,000 years or more. Were these drawings part of ritual ceremonies or shaman visions? We can only speculate.

Luckily, your puzzle is much simpler than understanding the origins of the petroglyphs. Just determine which two drawings are identical.



Hint: p. 119

Answer: p. 147

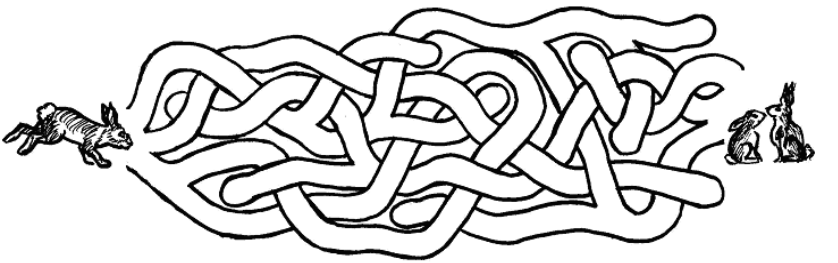
3. Rabbit or Jackalope?

Valley of Fire SP

On vacation in The Valley of Fire State Park near Lake Mead, I saw a Jackalope (the cross between a jackrabbit and an antelope). I saw the fabled jackalope right there in the shadow of Atlatl Rock. Well, it might have been an ordinary jackrabbit. Come to think of it, the animal didn't look exactly like the creatures I've seen on postcards and wall-mounted taxidermy in souvenir shops. Okay, maybe it had long ears instead of antler-like horns.

Let's try a simple puzzle.

Harriet, a Welsh rabbit, is leaving Warren, her husband. She has two more of her little babies to escort out through her underground tunnels. Help her travel to the babies through this "weave" (three-dimensional) maze. Paths that appear to pass under each other can be used to cross, but not turn at other paths.



Hint: p. 119

Answer: p. 148

4. Nine Lives

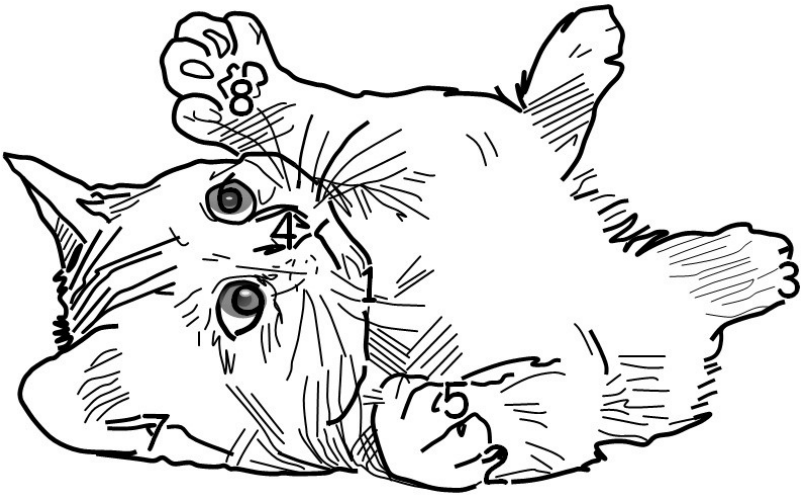
The Cat House, Rosamond CA

Who would expect to find a breeding zoo and research facility for endangered cats in the Mojave Desert? The Exotic Feline Breeding Compound (EFBC) Feline Conservation Center is dedicated to the preservation of endangered felines including caracal, jaguar, leopard, lynx, and other large cats (over 70 in all). EFBC is ranked in the top 1% of all US non-profit charitable organizations.

Although the center has a long name, people often refer to it as The Cat House. So don't be alarmed if you see a bumper sticker telling you to "Support Your Local Cat House."

Here is a puzzle that came to mind:

This cute little kitten still has all nine of her lives. Can you find all nine?



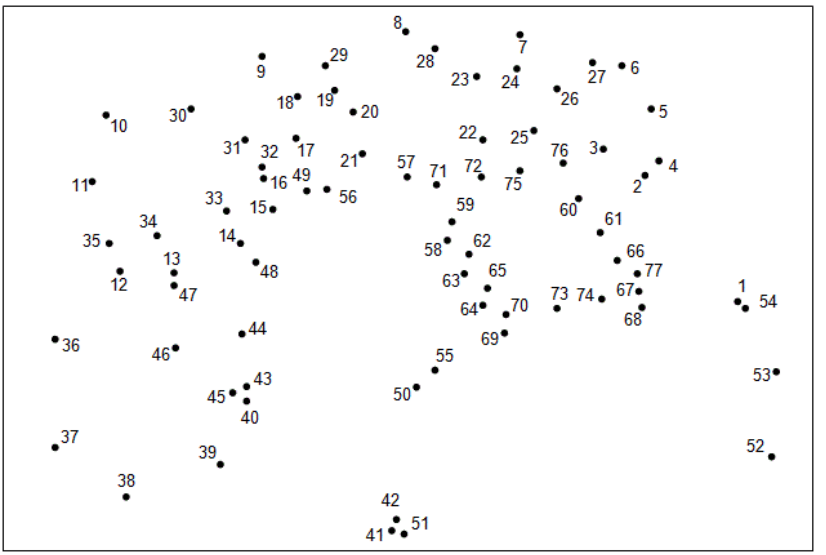
Hint: p. 119 Answer: p. 148

5. Constellation Connecting

Saddleback Butte SP

Saddleback Butte State Park is high ground in the high desert of Southern California. At the top of Saddleback Butte the night sky can be dark enough to see the Milky Way. When I see so many stars, I wonder how they got grouped into constellations. Often I don't see the creatures and objects that the ancients saw in the sky.

Here is your chance to connect the dots and create a new constellation. See if you can figure out what is pictured without actually drawing any lines.



Hint: p. 119

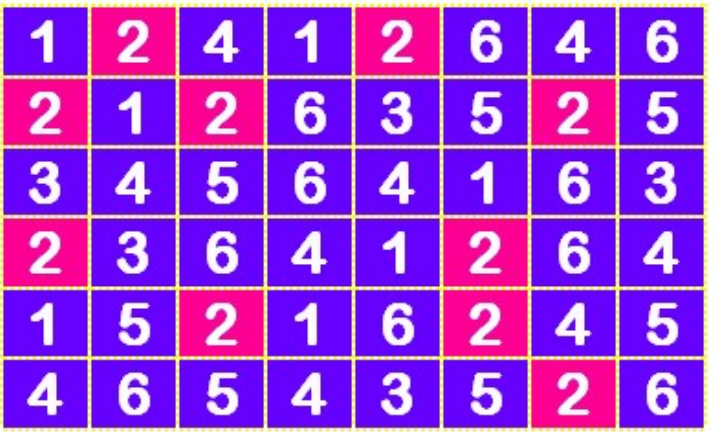
Answer: p. 148

6. One Difference Maze

Keno Board, Mesquite NV

You can't avoid it. You may be sitting in a cocktail lounge, a coffee shop, or a hotel lobby. If you are anywhere near a gambling casino in Nevada, you will see keno screens announcing the current lottery numbers drawn. Players bet on their selections of numbers from 80 possibilities. The casino running the game determines the payout rate. Like the big state-run lotteries, the house always wins.

I think of keno when I see this maze puzzle. Start in the upper left-hand corner of this grid and move from number to number until you reach the lower right-hand corner. You may move up, down, right, left, or diagonally to any adjacent number as long as its value is either 1 higher or 1 lower than the number you are moving off of. For example, your first move could be to either 2 but not diagonally to the 1.



Hint: p. 119

Answer: p. 149

7. Alphabetical Order

Zzyzx Desert Studies Center

When Curtis Howe Springer opened a health spa at the oasis of Soda Springs, he renamed it Zzyzx. He said it was the last word in the English language. Everyone always wants to have the last word. In 1974, the land was reclaimed by the government. The Bureau of Land Management allows the California State University to maintain a Desert Studies Center in Zzyzx. Otherwise it might have become a desert ghost town.

Someone told me the following words were in alphabetical order. How did he prove it?

almost begins ghost biopsy empty first chintz

Hint: p. 120 Answer: p. 149

8. Irregular Verbs

Robbers Roost, Armistead CA

Overlooking the southern portion of the Indian Wells Valley is a jagged and highly irregular rock formation. It is named Robbers Roost because banditos used it as a hideout in the late 1800s. From the top of the Roost the desperados could see ore shipments, stagecoaches, and angry posses long before they drew near. These days the area is a nesting spot for birds of prey, so don't shoot anything but photos.

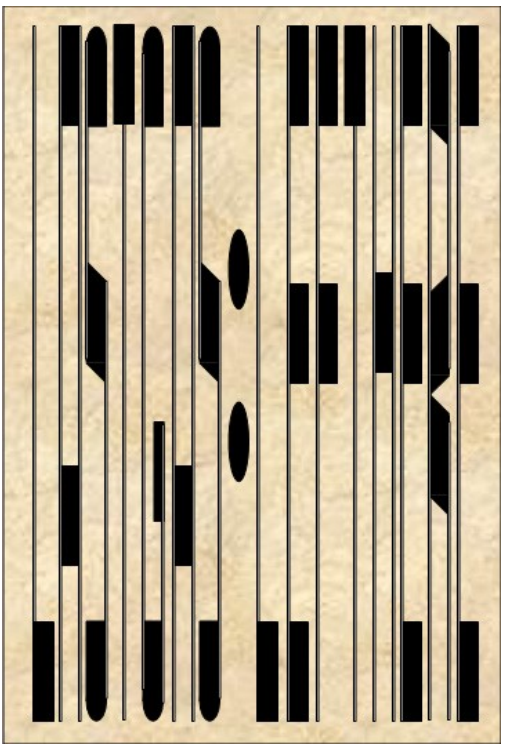
In English a verb is often converted to past tense by adding 'ed' to the end. But there are also many irregular verbs that don't follow this rule. What are some examples of verbs where the past tense is formed by ***removing*** a letter or letters from the present tense? I came up with 11 examples, but getting 5 or more is pretty respectable.

Hint: p. 120 Answer: p. 150

9. Blythe Geoglyphs

Desert Geoglyphs, Blythe CA

Geoglyphs are drawings scraped out of the desert surface; they seem to be intended for viewing from high in the air, an odd perspective for art created centuries ago. Like the famous Nazca Lines in Peru, the Blythe Geoglyphs were made by humans who scraped away darker rock to reveal lighter soil below.



No one seems to be able to explain why someone would make geoglyphs for viewing from the sky, but maybe you can make sense out of the art on the left. It might be more appropriate as a message around Blythe.

Hint: p. 120

Answer: p. 150

10. Sign Language

DMV, Ridgecrest CA

I needed to renew my California driver's license. To avoid long lines I drove up to Ridgecrest DMV in the heart of the Mojave Desert. It was not the best idea I ever had. The written exam had questions testing my understanding of various signs. Here is a test of your understanding of signs. Which of these four signs are right and which are wrong?

Sign 1	Sign 2	Sign 3	Sign 4
At least one of these signs is right.	Exactly one of these signs is wrong.	At least one of these signs is wrong.	Sign 2 is wrong.

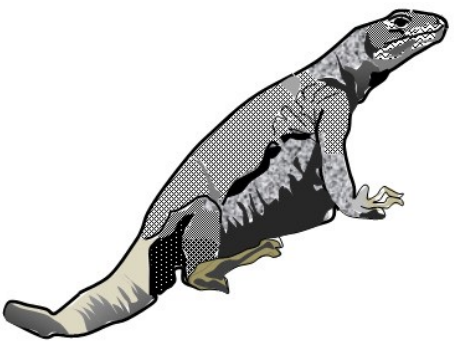
Hint: p. 120

Answer: p. 150

11. Kids and Pets

Chuckwalla

While visiting Mitchell Caverns in the Mojave National Preserve, I saw a chuckwalla. Chuckwallas are stocky, wide-bodied lizards with faces that even a mother might not love.



Three children, Chuck, Wallace, and Mary, are (in no particular order) 10, 11, and 12 years of age. They own a cat, a dog, and a chuckwalla (also in no particular order). Please figure out how old each child is and what animal they own. Your clue is:

Chuck is older than the boy whose dog chased the ten-year-old's cat.

Hint: p. 120

Answer: p. 151

12. Give Me a Break

California Poppy Reserve SNR

For a few weeks each spring some of the fields and hillsides of the Antelope Valley break out in a riot of color as California poppies bloom. It is particularly amazing to see this display in the desert, and so close to the urban sprawl of Los Angeles. The state nature reserve includes purple lupines and yellow goldfields as well as the bright orange of poppies. In a wet year, flowers blanket acres of the otherwise monochrome valley. Take a break to stop and smell the flowers.

The consensus is these sentences are senseless. Since you possess super sentence sense, see if you sense what these sentences say.

1. GE tag rip
2. Ill God owns wing in G
3. It shot a shades
4. You can twin the mall
5. Ready out her Io tact
6. You're a PW hat, you sow
7. Sophy (sic) I an healthy's elf
8. St. Rikew, "Hi, let heir on I shot."
9. Closet he's table do, O rafter, them are ha SG-One
10. The rear en one sob, Linda's, tho' sew how ill not see

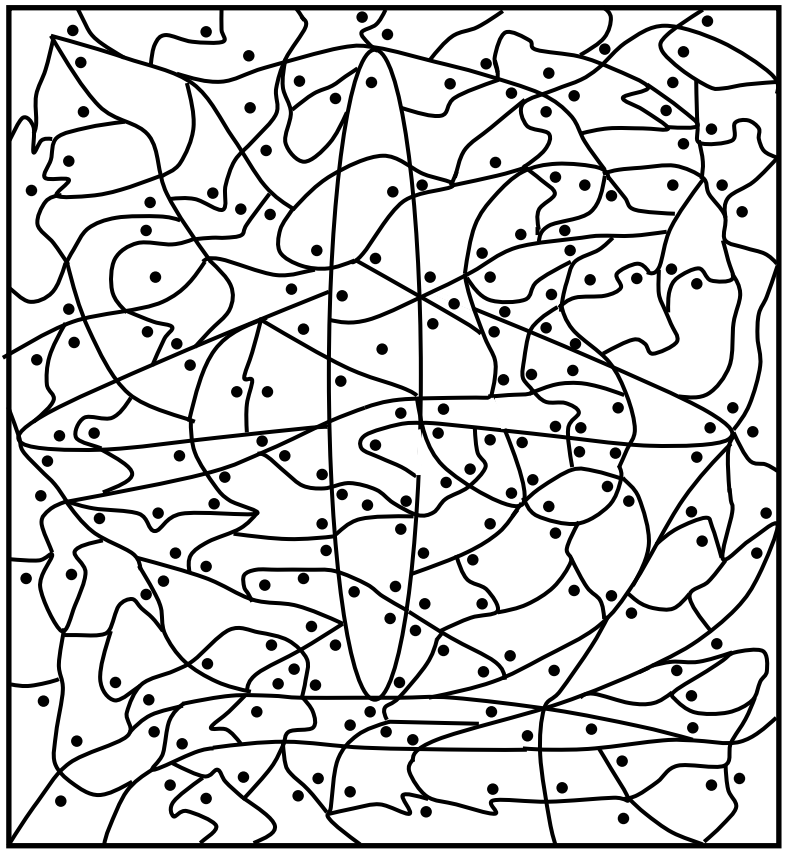
Hint: p.120 Answer: p. 151

13. Paint by Numbers

Airplane Boneyard, Mojave CA

New Yorkers may retire in Florida, but commercial jets retire in Mojave. Over 100 aircraft are parked in the airplane boneyard; most will never fly again. Some will be cannibalized for spare parts or used as sets and props by movie crews.

Your puzzle is to find something hidden in the hodgepodge of junk below. If you blacken each region containing two dots (not the areas with only one dot), what silhouette would be formed?



Hint: p. 120

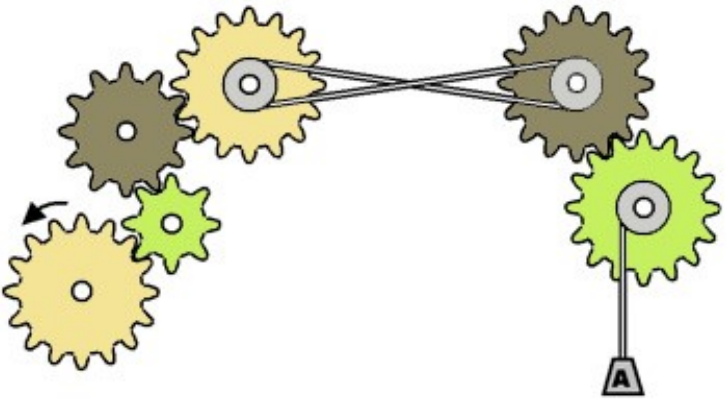
Answer: p. 151

14. Sprocket Science

WM Coolbots Robotics Team

The WM Coolbots robotics team is a group of youngsters from the Boys & Girls Club of the Antelope Valley. They construct robots that have competed with other teams at Joe Walker Middle School. Part of what they are learning is how gears work. So, one of the kids might have proposed the following problem to a teammate.

Will the weight (A) rise or fall when the gear on the left is turned counter-clockwise?



Hint: p. 121

Answer: p. 151

15. Mixed Doubles

University of Nevada, Las Vegas

The Rebels of UNLV compete in 16 sports as part of the NCAA Division I. These outstanding athletes got me thinking about sports. Take a swing at this puzzle:

Group the following words into pairs that can be pronounced as the name of a sport. For example, “saw” and “cur” could be paired to sound like soccer. Use each of the 16 words in only one pair.

aye Bach bass bawl chi cling craws dulls heard

high lock lye psi sake sing yakking

Hint: p. 121

Answer: p. 152

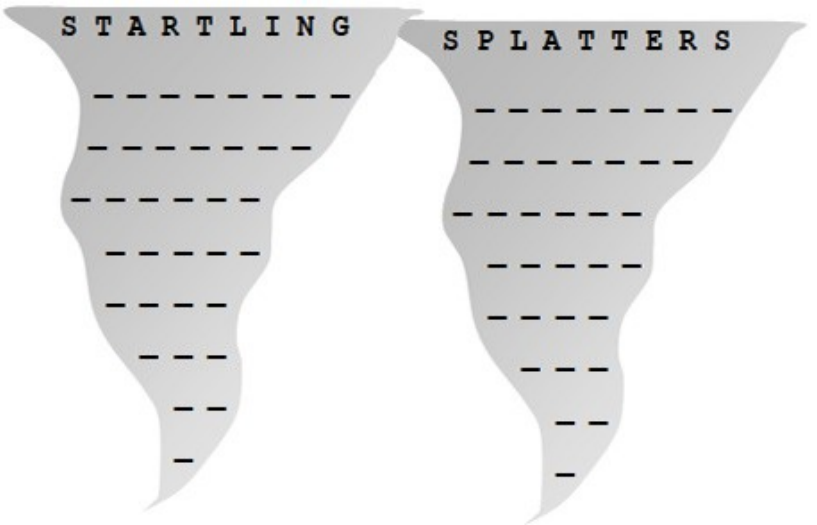
16. Rhyolite Funnel Cloud

Wet Death Valley

1992 was a surprisingly wet year in Death Valley. Badwater Basin, the lowest point in North America, was temporarily a lake where some people waded waist-deep. Wildflowers blossomed in the usually-barren desert. And drizzling rain dampened my side trip to the Nevada ghost town of Rhyolite.

As my family explored the ruins of the abandoned mining town, we were stunned to see a funnel cloud in the distance over Death Valley. The funnel cloud didn't reach the ground and become a tornado, but we never expected to see such wild weather in the Mojave Desert.

Remove one letter from the word at the top of the funnel cloud to create another common English word. Don't rearrange the remaining letters. Continue creating new words by deleting one letter all the way down until you get to a one-letter word. Then do the same for the second funnel cloud.



Hint: p. 121

Answer: p. 152

17. Piggyback Shuttle

Joe Davies Air Park, Palmdale CA

Up until 2002, NASA had built and modified space shuttles in Palmdale, California. I once had a chance to witness a shuttle being hoisted onto the back of a Boeing 747. Later I watched as space shuttle Endeavour was flown piggyback in a low-level flyover of the repair facility on its way to the California Science Center in Los Angeles. The shuttles are gone, but one of the modified 747s is on display at the Joe Davies Heritage Air Park in Palmdale, California.

The space shuttle got carried piggyback on a 747. Words can be carried piggyback, too. When a word splits another word to form a third word, that third word is a piggyback word. For example, 'recently' has the word 'rely' split by the word 'cent.' The inserted word can split the other word off center as in s(event)een. Notice that the word 'notice' is not a piggyback word. Even though 'not' and 'ice' are both words, 'ice' doesn't split the other word.

See how many piggyback words you can find in the following two sentences:

Someone became bothered that the shuttle was flawed and not totally airworthy. A designer with foresight advised against operating with weather in the twenties, thinking the mission was endangered.

Hint: p. 121 Answer: p. 152

Part 2: Mirages

Mirages are optical illusions. The most common mirage is seeing pools of water on parched desert or dry road. Hot air rising from the desert causes the bending (refraction) of light from the sky. Sometimes a vision of buildings or vegetation from beyond the horizon will appear to be nearby when it is actually far off. Mirages occur naturally, but the puzzles in this section are all artificial.

18. Vision of Gold

El Mirage Dry Lake

El Mirage Dry Lake is an off-road recreation area for ATVs, land sailing, ultralight aircraft, and gyrocopters. The funny thing is that the lake is closed when it's wet, and often it looks wet when it's dry.

Your eyes and your mind may be deceived. A vision may seem to waver at the horizon. Nothing is really there, but you think you see something – something associated with gold.

What do you see in the 'mirage'?

Hint: p. 122

Answer: p. 153

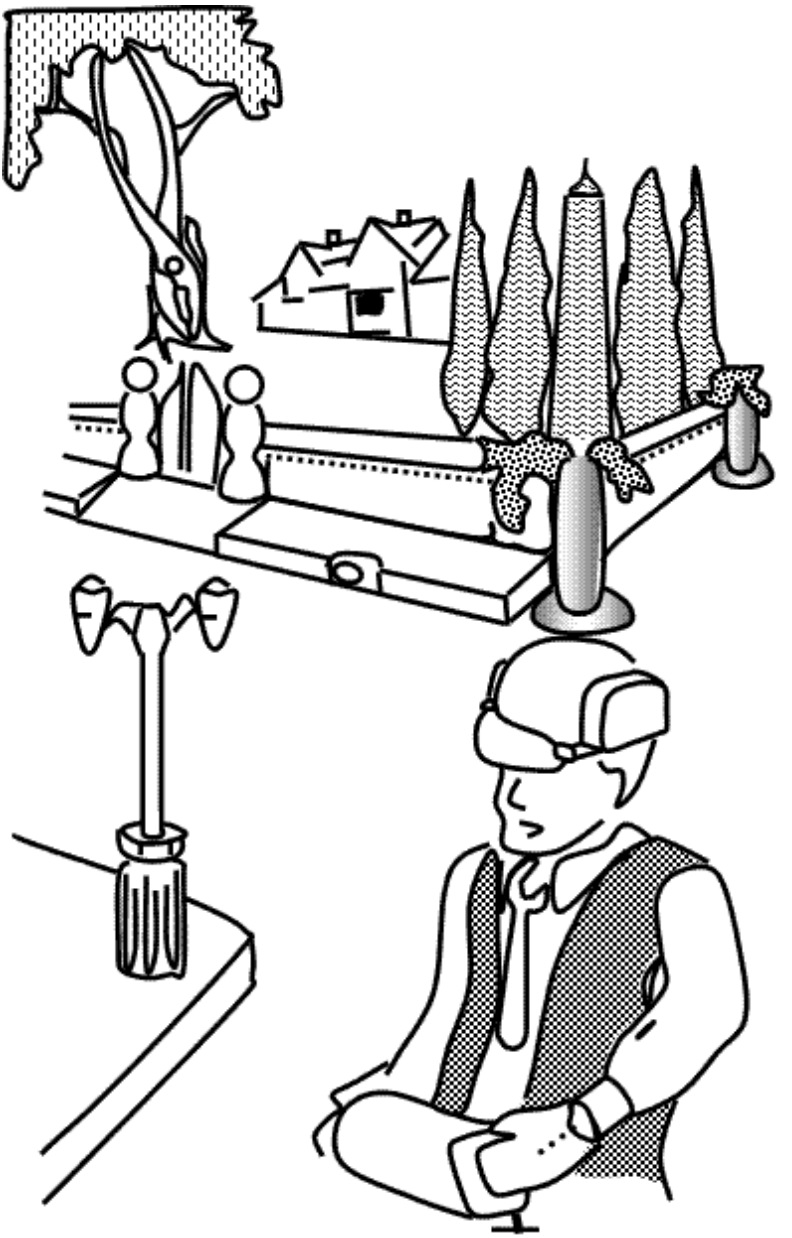
19. Seeing Things

St. George UT

At the extreme northeast edge of the Mojave Desert, St. George, Utah, experiences hot summers and cold winters. Pictured on the following page is one neighborhood.

Several objects have been hidden in that picture. They all have something in common. When you've found a few of them, that common denominator should become clear.

See the hints if you'd like a list of the ten objects that are hidden in the picture.



Hint: p. 122

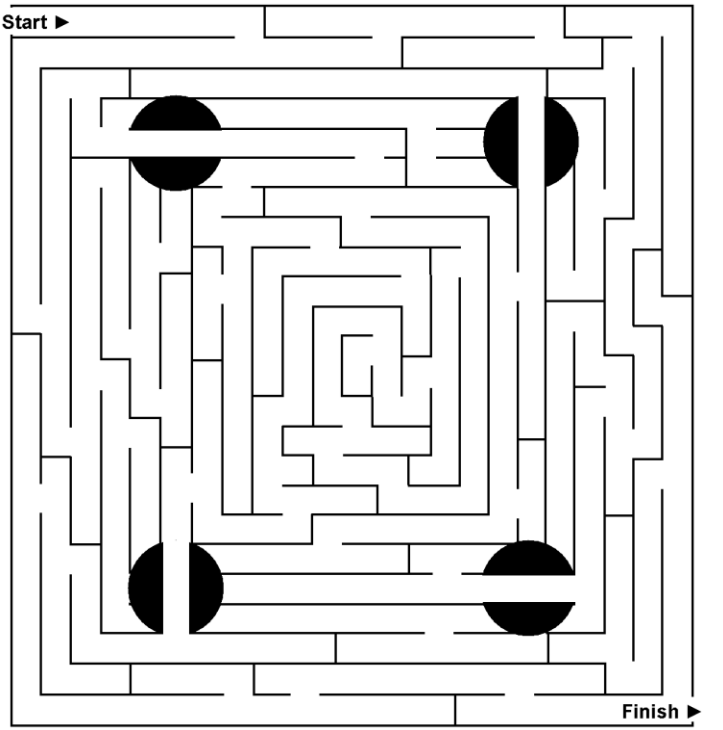
Answer: p. 153

20. Roundhouses

Kelso Depot, Mojave National Preserve

Kelso Depot began as a water stop for steam locomotives on the Los Angeles and Salt Lake Railroad. The railroad carried passengers and cargo, especially ore from nearby mining operations.

This maze has black circles that represent roundhouses. Like old-fashioned railroad roundhouses, each circle can rotate to change the orientation of the path it contains. Every time you enter a path through one of the roundhouses, the roundhouse (circle) will immediately rotate 90°. So, if you enter from the east or west, you must exit to the north or south. If you enter from the north or south, you must exit to the east or west. You can never go straight through a roundhouse. With that complication in mind, find your way from the start to the finish.



Hint: p. 122

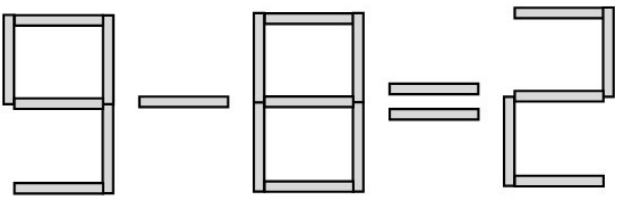
Answer: p. 154

21. Curious Equation

Author's home office, Palmdale CA

I was sitting at my desk fiddling with a pile of matchsticks when my little granddaughter came in. She stared at me across the desk and asked what I was doing. I explained that I was using the sticks to form numbers, like the numbers on the digital clock nearby. She said, "That's easy." She looked at the clock and formed a "2." I told her that I really wanted to make some equations, like "2 + 2 = 4." "Oh, that's too easy," she said. "Let me make a harder one."

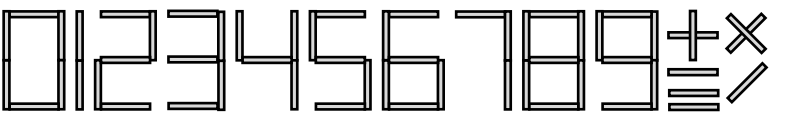
I was called away for a moment, but when I sat down at the desk again, I saw this equation:



I asked her if she was sure that the equation was correct. She assured me it was and proceeded to show me. How did she prove that the equation was right?

Hint: p. 122 Answer: p. 154

After my granddaughter left, I created a few puzzles that use matchsticks to form Arabic numbers like those found on a digital clock or calculator. The numbers and operators I used look like this:

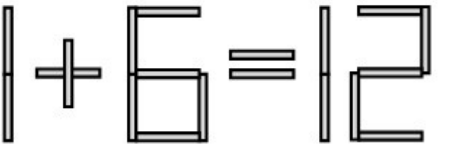


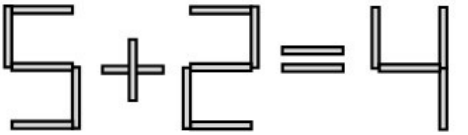
See the puzzles on the next page.

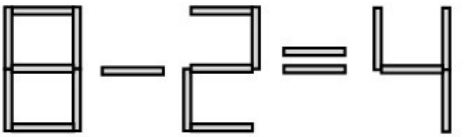
22. Matchstick Math - Digital

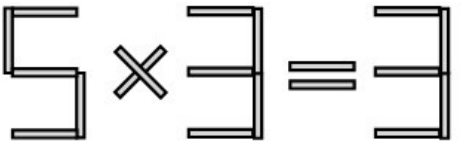
Home office, Palmdale CA

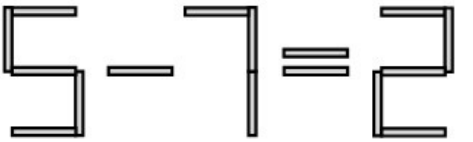
In each puzzle, move one match to make the equation correct.

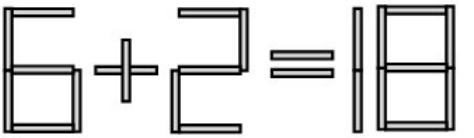
1. 

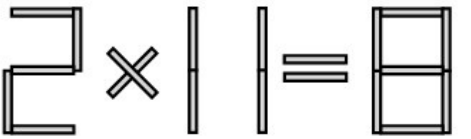
2. 

3. 

4. 

5. 

6. 

7. 

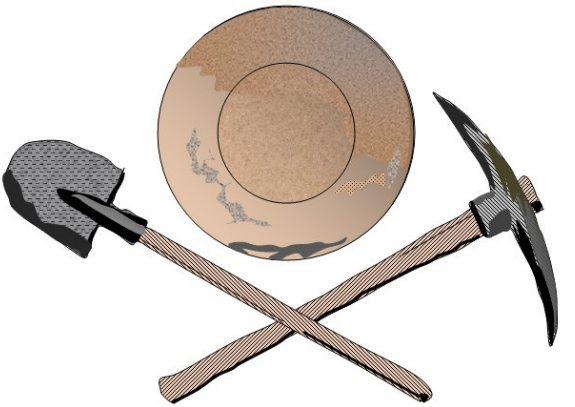
Hint: p. 122

Answer: p. 154

23. Word Prospecting

El Paso Mountains, Garlock CA

The El Paso Mountains area between Mojave and Ridgecrest boasts dozens of former mines. The late 1800s saw prospectors scouring the hills for precious minerals. Although no "Mother Lode" was found, miners made some profitable finds. Today, the area attracts weekend prospectors and rock hounds who shift through the tailings. Valuable discoveries are sometimes hidden in plain sight.



This puzzle asks you to find words for things that might be dug out of the Mojave Desert. Ignore capitalization, punctuation, and spacing to find the hidden words. For example, find the word 'turquoise' in:

The Latin phrase "non sequitur quo" is easily misspelled.

1. "Getting old is no picnic," Kelly moaned.
2. My search might lead to topaz in clay deposits.
3. The rookie cop permits altercations as my neighbor axes the tree.
4. We must repair one fossil very soon.
5. We catch Rome's consul furnishing more dental care.

Try to find at least 11 words. We think there are about 17.

Hint: p. 122 Answer: p. 155

24. Is Siberia by Syria? National Trails Hwy, Historic Route 66

If you drive from Klondike to Bagdad, you pass through Siberia – all in only 11 miles. In its heyday, "The Mother Road" (Route 66) passed through these California desert towns. Interstate 40 stole the traffic, and communities along the old road became ghost towns. Other nearby towns include Glasgow and Cadiz.

What unusual characteristic do each of these phrases have in common?

Make it from tea

Winning your spiels

Fight a liar

Bit the hooks

Bunny phone

Chain wreck

Warty finks

Hint: p. 123 Answer: p. 156

25. Arithmetic by Twos Cholla Cactus, Joshua Tree NP

Joshua Tree National Park features a garden of cholla (teddy bear) cactus plants at the southern edge of the Mojave Desert. Two deserts meet here. The Mojave blends with the Colorado Desert to the south. Plant and animal species spill over between the two environments. You can hike both deserts in the same day.

Determine four different positive integers (W, X, Y, and Z) such that:

$$W + X + Y + Z = 54 \text{ and } W + 2 = X - 2 = Y \times 2 = Z / 2.$$

Hint: p. 123 Answer: p. 156

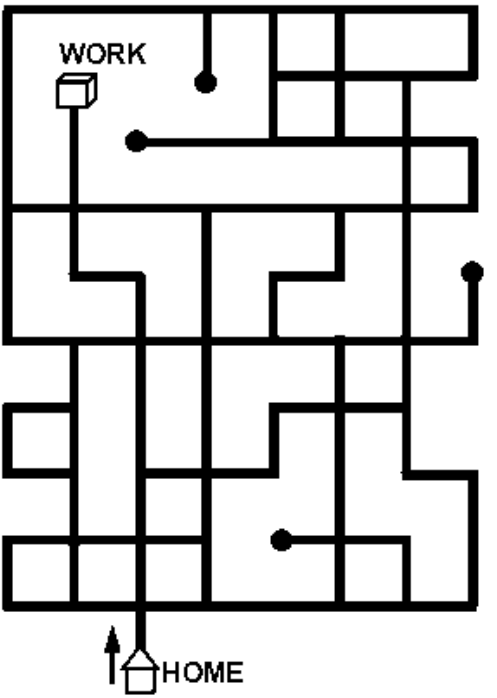
26. No Left Turn

Commuting from the Desert

Some desert dwellers work in Los Angeles and make that long commute every day. Traffic congestion often causes them to seek alternate routes. This puzzle has you looking for other routes.

Drive from HOME (bottom of map) to WORK (near the top) along the streets (heavy black lines). The problem is that there's a new law in town. It's now illegal to turn left or to make a U-turn along the streets; you can't go in reverse either. You can only continue straight ahead or turn right.

You used to go straight along the street from home, make a little jog to the left, and head straight into the company parking lot. Now you'll have to find a new route. After you find the shortest route to work, assume that you can make a legal U-turn in the company parking lot and find a good route home.



Hint: p. 123

Answer: p. 156

27. Playing Post Office? U. S. Post Office in Victorville CA

Post Office worker Misty Livermore removes a few letters from a bag and begins sorting them. Her coworker, Aletta Carrier, places some letters into boxes and then gets some more letters from Misty's bag. Neither woman is paying any attention to addresses or ZIP codes; they are totally ignoring postal regulations and procedures. This activity involves a counter, but no customers are present. In fact, this activity has nothing to do with their jobs at the post office. What are they doing?

Hint: p. 123 Answer: p. 158

28. Voter Registration Nipton CA

When Nipton, California, was dwindling toward becoming a ghost town, the remaining residents decided to sell the town outright. The buyers intended to turn Nipton into a cannabis-themed resort. It gives new meaning to the phrase "high desert." With very few people living in town, imagine this situation.

Mary Jane Potter and Bernie Hayes are discussing political strategy for the desert community of Nipton. They agree that Nipton has a total of 16 people (men and women) who are registered to vote. They also know that four ninths of the men are registered as Republicans. How many women are registered to vote in Nipton?

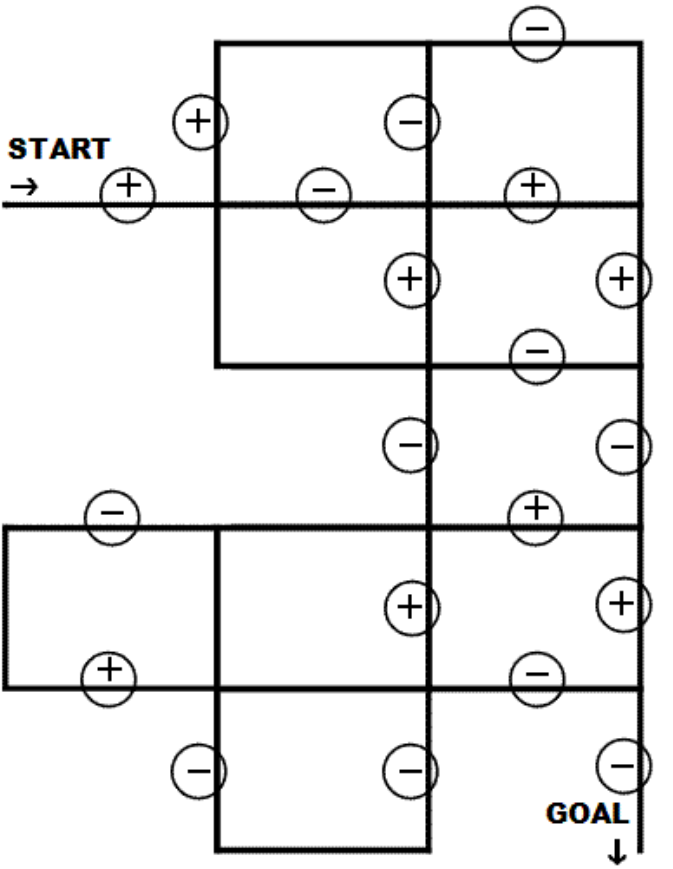
Hint: p. 123 Answer: p. 158

29. Alternating Current

Hoover Dam, Colorado River

Hoover Dam generates about 4 billion kilowatt-hours of hydro-electric power each year for California, Nevada, and Arizona.

This puzzle asks you to charge along the black lines in this maze from the Start to the Goal. As you go, you will pass through some positive (+) and negative (-) zones. When you enter such a zone, you must exit on the other side; you can't reverse direction in a zone. And you must alternate positive and negative zones. You can't pass through two positive zones without passing through a negative zone in between (or two negative zones without a positive zone).



Hint: p. 123

Answer: p. 159

30. Murder Mystery 1

Dinner Theater, Mojave CA

I once auditioned for a role in a murder mystery. It was part of a dinner theater production at a restaurant in Mojave. Luckily, the director came to his senses and cast someone else.

Your goal is to determine the murderer, the weapon, and the room by using the clues presented. There are six choices in each category:

Suspects	Weapons	Rooms
Ms. Bluebird	Baseball Bat	Bedroom
Miss Crimson	Cleaver	Closet
Mrs. Ivory	Dumbbell	Den
Mr. Kelly	Poison	Foyer
Prof. Periwinkle	Shotgun	Garage
Sgt. Saffron	Telephone Cord	Washroom

The puzzle presents a series of numbered clues. Each clue is in the form of a statement followed by a number. The number indicates how many elements mentioned in the statement are part of the correct answer. For example, statement number 1 is followed by a "1", so exactly one of the three elements (Ms. Bluebird, poison, or bedroom) is part of the solution. In this case, if Ms. Bluebird is the murderer, then the poison and the bedroom did not play a part in the murder. See if you can figure out whodunit with what weapon in what room.

1. Ms. Bluebird did it with the poison in the bedroom. (1)
2. Mr. Kelly did it with the baseball bat in the den. (1)
3. The weapon is either the cleaver or the shotgun. (1)
4. Mrs. Ivory did it with the shotgun in the foyer. (1)
5. The murderer is either Mrs. Ivory or Ms. Bluebird. (1)

Hint: p. 123 Answer: p. 160

31. Murder Mystery 2

Dinner Theater, Mojave CA

Again, your goal is to find the murderer, the weapon, and the room by using the clues presented. There are six choices in each category:

Suspects	Weapons	Rooms
Ms. Bluebird	Baseball Bat	Bedroom
Miss Crimson	Cleaver	Closet
Mrs. Ivory	Dumbbell	Den
Mr. Kelly	Poison	Foyer
Prof. Periwinkle	Shotgun	Garage
Sgt. Saffron	Telephone Cord	Washroom

The puzzle presents a series of numbered clues. Each clue is in the form of a statement followed by a number. The number indicates how many elements mentioned in the statement are part of the correct answer. For example, statement number 1 is followed by a "1", so exactly one of the three elements (Sgt. Saffron, telephone cord, or garage) is part of the solution. In this case, if Sgt. Saffron is the murderer, then the telephone cord and the garage did not play a part in the murder. See if you can figure out whodunit with what weapon in what room.

1. Sgt. Saffron did it with the telephone cord in the garage. (1)
2. The murder was committed by Miss Crimson in the foyer with the dumbbell. (1)
3. Prof. Periwinkle did it in the washroom with the cleaver. (0)
4. The murder was committed in the foyer using either the telephone cord or the poison. (1)
5. Mr. Kelly did it with the poison in the washroom. (1)

Hint: p. 124 Answer: p. 160

32. Murder Mystery 3

Dinner Theater, Mojave CA

Again, your goal is to find the murderer, the weapon, and the room by using the clues presented. There are six choices in each category:

Suspects	Weapons	Rooms
Ms. Bluebird	Baseball Bat	Bedroom
Miss Crimson	Cleaver	Closet
Mrs. Ivory	Dumbbell	Den
Mr. Kelly	Poison	Foyer
Prof. Periwinkle	Shotgun	Garage
Sgt. Saffron	Telephone Cord	Washroom

The puzzle presents a series of numbered clues. Each clue is in the form of a statement followed by a number. The number indicates how many elements mentioned in the statement are part of the correct answer. For example, statement number 1 is followed by a "1", so exactly one of the three elements (Ms. Bluebird, telephone cord, or closet) is part of the solution. In this case, if Ms. Bluebird is the murderer, then the telephone cord and the closet did not play a part in the murder. See if you can figure out whodunit with what weapon in what room.

1. Ms. Bluebird committed the murder in the closet with the telephone cord. (1)
2. Prof. Periwinkle killed the victim with the baseball bat in the den. (1)
3. Miss Crimson used the poison in the garage. (0)
4. Ms. Bluebird did it with the shotgun in the den. (1)
5. The murder was committed in the washroom or the foyer by Mr. Kelly. (0)
6. Sgt. Saffron did it with the telephone cord in the bedroom. (0)

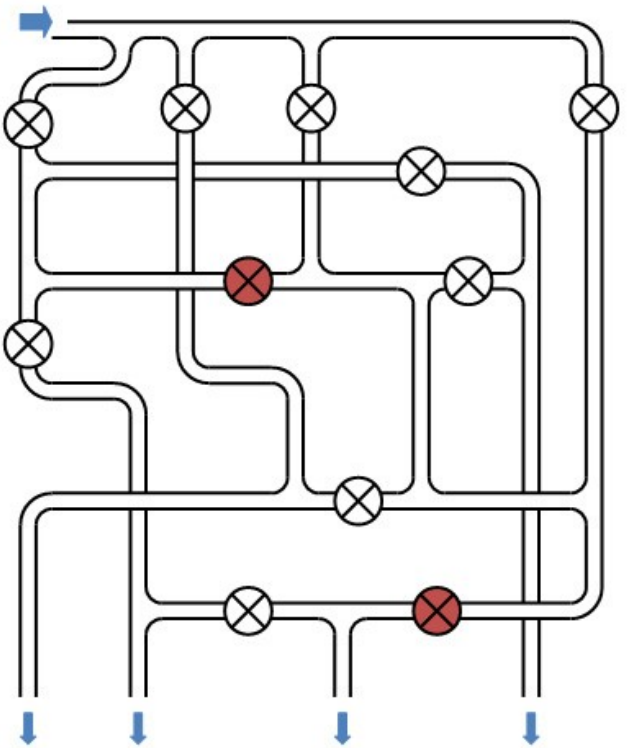
Hint: p. 124 Answer: p. 161

33. Irrigation

California Aqueduct

The California Aqueduct is a man-made river carrying water from Northern California to Southern California. The East Branch ends at Silverwood Reservoir which serves the Mojave Desert.

Water flows through these pipes under pressure from the arrow at the upper left of the diagram. The pressure will even send the water "uphill" through every open path. Valves (⊗) can be used to shut off the flow in some sections of pipe. The darkened valves are closed. All others are open. Your job is to close exactly two valves and thereby shut off the outflow of water to three of the four exits at the bottom of the diagram. Only one exit should have a flow of water.



Hint: p. 124

Answer: p. 161

34. Word Building 3x3 London Bridge, Lake Havasu City

The founder of Lake Havasu City, Robert P. McCulloch, Sr., bought London Bridge in 1968. As the structure was dismantled, each of the 10,276 exterior granite blocks was numbered and its position recorded. The blocks were shipped to Arizona and reassembled over a man-made channel of Lake Havasu. Let's see if we can assemble words from three-letter blocks without numbered instructions.

Form nine-letter words by grouping three of the three-letter units. For example, ACH, BLE, and ERS could form BLEACHERS. Each three-letter unit will be used exactly once. Blocks in the same row aren't necessarily parts of the same word. Blocks in the left column aren't necessarily the first part of the words.

Group 1

ADS	IDE	REF
ANS	ING	SPA
ARM	INT	SPE
BRO	IZE	THE
CIT	NRY	TTI
GHE	ORE	WER

Group 2

ACH	ICE	STS
ANT	LAM	TES
ARD	IDO	TIC
CHO	PPO	TRE
COW	PSY	UNE
ERY	SED	XPO

Group 3

ACH	ITY	RTY
ANT	LTY	SPE
ARD	PAR	STO
CIA	PAT	TIC
COU	PRO	UTE
IPA	RIO	XIM

Hint: p. 124 Answer: p. 162

35. Breaking the Sound Barrier Edwards Air Force Base

In 1947, the young test pilot Chuck Yeager was chosen to fly the plane that would break the sound barrier. The plane, nicknamed the "Glamorous Glennis" for Yeager's wife, was a rocket-powered X-1. Yeager exceeded the speed of sound with a boom at an altitude of 43,000 feet. Well, actually the pilot doesn't hear the sonic boom because the plane is faster than sound.

Can you figure out what each of the following phrases is saying?

- Sick soak lock gnus
- Crass shape arty
- A tower's leap
- Key pure fee taunt thug round
- Innate heights pot
- Fill matte teal Evan
- Whiz sells top to her
- Ewe half toot ache the bit err width thus wheat

Hint: p. 125 Answer: p. 162

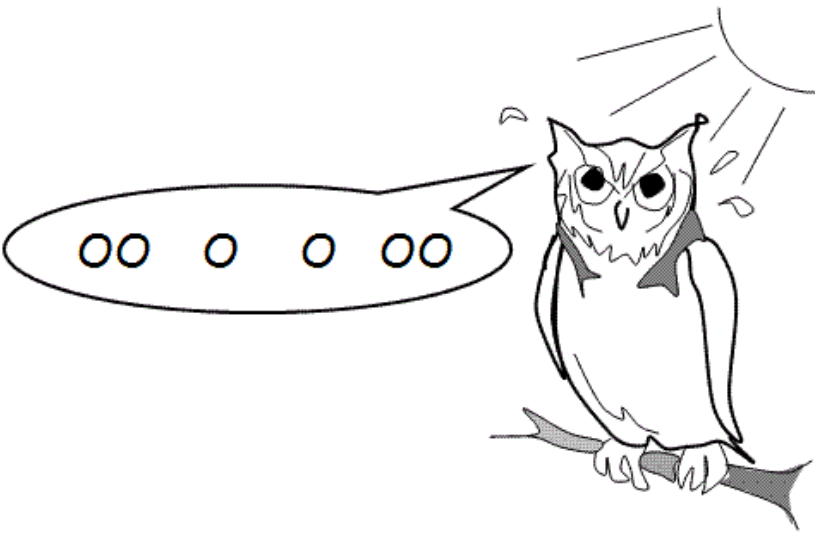
36. Owling at the Sun

Ripley Desert Woodland SP

The Arthur B. Ripley Desert Woodland State Park is a small forest preserve of Joshua trees and California junipers. A stroll through the preserve always gives me a feel for what the desert might have been like before civilization encroached.

Great horned owls sometimes make their nests among the branches of the Joshua trees. Burrowing owls live and raise their young in underground burrows. Of course, you rarely see these birds of prey during the day. Their superb vision and hearing are adapted for hunting at night. Most of their prey is active in the cooler night hours, as well.

Add 6 letters to the owl's quotation and create an appropriate palindrome. (A palindrome is a word or phrase that is spelled the same forwards and backwards.) The 6 letters will be consonants formed from 14 straight line segments and no curved lines.



Hint: p. 125

Answer: p. 163

37. So Hard

El Garces Hotel, Needles CA

Fred Harvey created the first restaurant chain in the U.S. His company partnered with the Santa Fe Railroad to provide hospitality (restaurants and hotels) at key points along the railroad routes.

The Fred Harvey Company built the El Garces Hotel and Santa Fe Station in 1908. It is recorded in the National Registry of Historic Places. Now it serves as an Amtrak station. It is located at one of the few bridges crossing the Colorado River between Arizona and California.

This is one of the hottest areas of the Mojave Desert. In 2012 this area recorded the hottest rain water (115°F) in world history (a record since broken elsewhere).

It may be difficult to determine why any of this inspired the following riddle.

If you want me to be useful,
Here is something you should try:
Find me sitting on a cushion
And just poke me in the eye.
Don't expect it to be easy.
First, I'm awfully hard to find,
For my hiding's legendary
Like that phrase that comes to mind.
And besides, I will resist you,
And I'm known for punching hands.
Then I'll slip into your clothing
Taking with me all the strands.

Hint: p. 125 Answer: p. 163

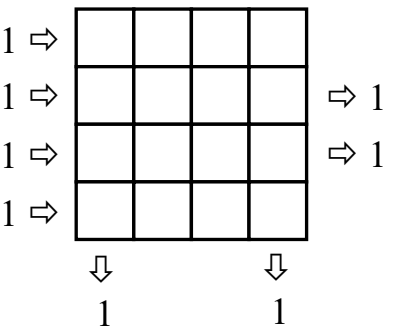
38. Oh, Pachink! Laughlin NV

Pachinko uses a sort of vertical Japanese slot machine as a gambling platform. The player launches small steel balls that fall through a pinball-like maze of pins, cups, and an exit hole. Game results can vary, especially during earthquakes.

This puzzle challenges you to place a specified number of blocks onto a grid so that flying/rolling/falling balls come out of the grid as predicted. One ball is rolled from left to right along each row of the grid. If it encounters a block, the ball will start to fall (roll downward). If a ball rolling down a column encounters a block, it will roll to the right until it no longer has a block directly under it; with no block under it, the ball will resume its fall.

You are told the number of blocks to be placed. You are also told the number of balls escaping from each row and column. Your task is to place the blocks so that the counts come out right.

Let's look at an example asking you to place 4 blocks:

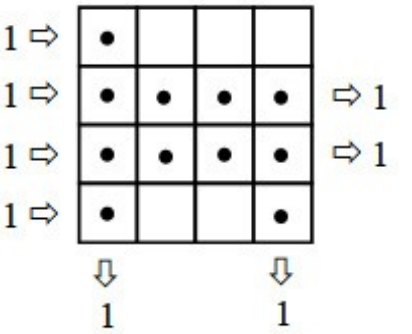


The left column in every puzzle can never have a block because the ball rolled from the left would never be able to enter the grid. Put a dot in the middle of each square in the left column to remind you that no block can go there.

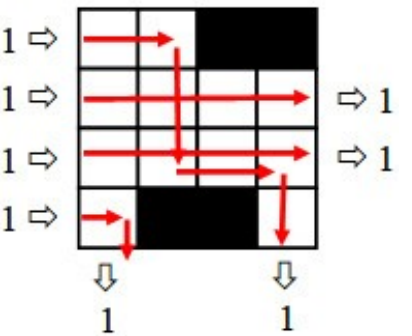
The ball falling out of the right column can only occur if a ball falls, hits a block, rolls to the right, and falls again. We know this because we cannot place a block outside the grid to make a ball fall down the right column. Place a dot in each of the bottom two squares of the right column to allow an exit for the ball.

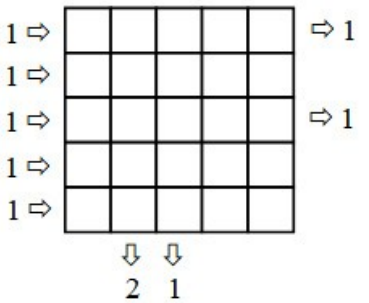
Although it is sometimes possible for a ball to escape the right side of the grid without going directly through the grid in a straight line, this sample grid probably follows the obvious route straight through. Fill the squares on the second and third rows with dots to indicate that no blocks go there.

The grid now has only 5 possible squares for the four blocks.

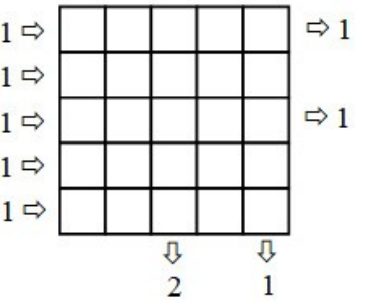


The ball that drops out of the left column must get deflected by a block in the second column of the bottom row. The ball from the top row must be the ball that falls out of the right column; it will be deflected and fall down the second column. Then it will roll across two blocks before it falls out the right column. The fourth block gets placed in the upper right square. The answer looks like this:

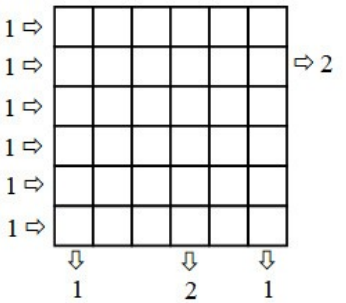




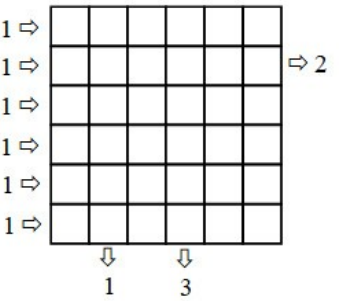
Puzzle 1: Place 3 blocks



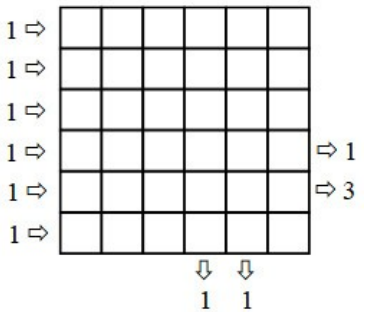
Puzzle 2: Place 3 blocks



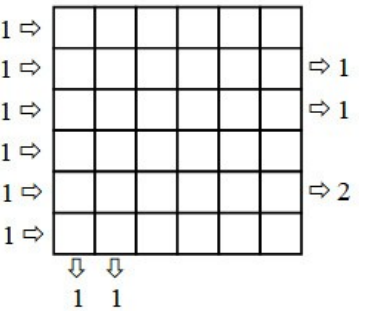
Puzzle 3: Place 6 blocks



Puzzle 4: Place 13 blocks



Puzzle 5: Place 5 blocks



Puzzle 6: Place 15 blocks

Hint: p. 126

Answer: p. 164

39. A Word in Common

Lockheed Martin Skunk Works

The famous Lockheed Martin Skunk Works has created some of the most amazing aircraft in history. Their engineers have designed the SR-71 Blackbird, U-2 Dragon Lady, F117 Nighthawk, and the F-35 Lightning II. Who knows? Maybe they are testing flying saucers out at Area 51 right now.

They are known for their creative solutions. Here is your chance to see how creative you are. The following puzzle is a sort of Remote Associates Test (RAT) which has long been used to measure creativity.

Each line below has six words that have something in common with another word. The missing word forms a common phrase or compound word with each of the listed words. Your goal is to determine the missing word for each line.

Example: book, print, navy, true, collar, angels Answer: blue.

Blue Book, blueprint, navy blue, true blue, blue collar, Blue Angels (USAF)

1. sun, wall, pot, wild, bed, garden
2. quarter, iron, fly, dark, sense, laugh
3. light, sun, check, bald, blind, weld
4. hand, string, chance, split, thought, nature
5. hand, off, box, water, break, fever
6. field, profit, fold, stage, piece, medical

Hint: p. 126 Answer: p. 165

40. Head Off to the Rocks Devil's Punchbowl Natural Area

The Devil's Punchbowl is a deep canyon cut through sedimentary rock that was folded into a v-shaped syncline. The county parks department calls it a "geological wonder."

When I was hiking with friends at the punchbowl, we watched as an unprepared free climber fell about 20 feet along a nearly-vertical rock face. A rescue helicopter airlifted the man to the Nature Center parking lot where he was taken away in an ambulance. The climber was conscious and didn't appear to be seriously injured. He did seem to be abashed as well as bashed ...losing face.

First, determine the 4- or 5-letter words defined on the left. Then remove the first letter of each word to get the words defined on the right. The dropped letters go in the center column. If you slide down that column, you'll spell out what the punchbowl really is.

Goes by horse	_ _ _ _ _	– _ =	_ _ _ _	Mid March
Sound in a pen	_ _ _ _	– _ =	_ _ _	Fluid in a pen
Rock drill sample	_ _ _ _	– _ =	_ _ _	Valuable rocks
Leafy superfood	_ _ _ _	– _ =	_ _ _	Beer
Clear and sunny	_ _ _ _	– _ =	_ _ _	The atmosphere
Was in debt	_ _ _ _	– _ =	_ _ _	Got married
Deceptive move	_ _ _ _	– _ =	_ _ _	Take advantage of
Lots of	_ _ _ _	– _ =	_ _ _	At least one
Once more	_ _ _ _ _	– _ =	_ _ _ _	Get more
Rose's point	_ _ _ _ _	– _ =	_ _ _ _	Rhino's point
Perfect	_ _ _ _ _	– _ =	_ _ _ _	Bargain
Not fenced in	_ _ _ _	– _ =	_ _ _	Fenced-in area
Close by	_ _ _ _	– _ =	_ _ _	Within ___ shot

Hint: p. 126 Answer: p. 165

41. Following Orders

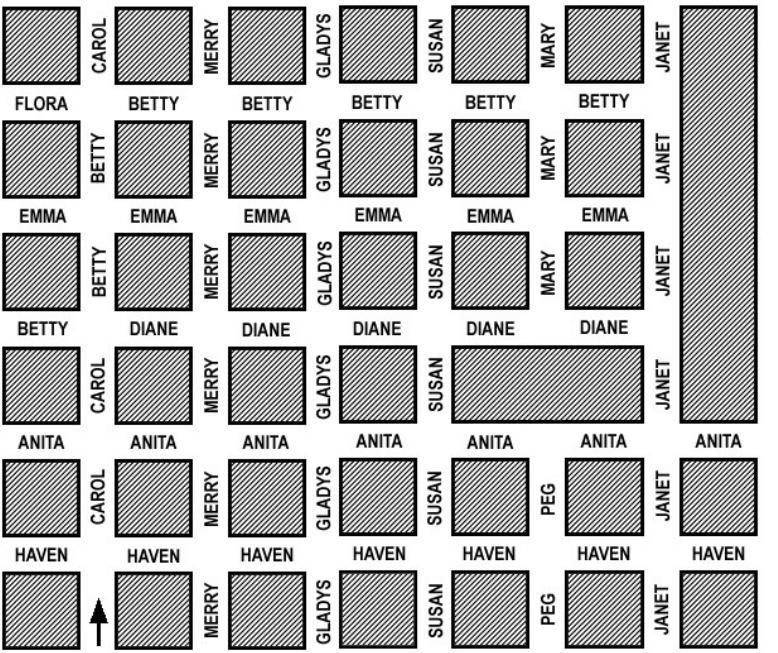
Marine Corps Combat Center

The country's largest Marine Base is located near Twentynine Palms. It serves as a training center for air and ground combat operations.

Here is your training exercise. The basic rules are as follows:

1. Execute the Route Instructions (RIs) in ascending numerical order.
2. Answer each question (Q) between the completions of the RIs most nearly surrounding the question.
3. RDWY is defined as a roadway with a different name than the roadway you are on

Consider yourself to be driving along the roadways indicated by the map. Carefully read and obey the basic rules listed above. Start at the arrow on the map (moving in the direction of the arrow). Directions (left and right) are relative to your direction of travel – not relative to the page of the book.



RI 1. Turn right at BETTY

Q1. Do you pass MARY?

RI 2. Turn right onto JANET

Q2. What is the name of the first RDWY you come to?

RI 3. Turn right onto HAVEN

RI 4. Turn right at Xth RDWY To determine X, use the following: ? = W + X + Y - Z, where W = 1, X = 5, Y = 2, and Z = 4.

Q3. What is the name of the roadway on which you are traveling?

RI 5. Turn right onto ANITA

RI 7. Turn left at first RDWY

RI 6. Turn right at first RDWY

Q4. Do you travel on HAVEN?

RI 8. Turn left onto JANET

Q5. What is the name of the first RDWY you come to?

RI 9. Turn left onto EMMA

RI 10. Stop driving. This is the end of the exercise.

Hint: p. 127 Answer: p. 166

42. Lost Silver

Friends of the Lancaster Library Book Sales

A few years ago I got three books at the Los Angeles County Library in Lancaster, California:

Antelope Trails and Pioneer Tales by Gloria Hine Gossard

High Mountains and Deep Valleys by Lew and Ginny Clark

A Flower-Watcher's Guide by Milt Stark

The books are still on my shelf at home, but I'm not accumulating huge overdue fines because I bought the books at the library's used books sales.

I particularly liked one story from Gloria Gossard's book, so I dropped a bookmark between page 21 and page 22 to remind me to mention it here. It concerns 19th century teamsters whose mules hauled wagon loads of silver ore from the mines of Cerro Gordo to railheads in Southern California.

One young teamster had a wagon filled with ore and a fine team of mules to pull it. He was in a hurry to reach his destination and ignored the storm clouds over the Sierras to the west. Other teamsters warned him of flash floods that would almost certainly wash down the canyons the road ran through. But the young man didn't wait out the storm like the more experienced men.

Sure enough, a thunderous torrent of run-off from the high Sierras caught the young man and his team. They were killed, the wagon was smashed to splinters, and the silver strewn and buried in mud. No one ever saw that man, his team, their wagon, or the silver again.

This story may be true or it may just be a tall tale. We'll probably never know unless someone finds the lost silver.

However, you should be able to prove (without resorting to the public library or the Internet) that I lied about something in the narrative above. What can't be true in the above?

Hint: p. 127 Answer: p. 166

Part 3: Miner Problems

The lure of gold and other valuable minerals attracted prospectors to the Mojave. When a strike was made, investors moved in to mine the treasure. But the challenges were daunting.

You have now moved to the next level of difficulty in your puzzle solving. Success may be harder to come by. Just keep digging.

Small Mine Cave-In

Yellow Aster Mine, Randsburg CA

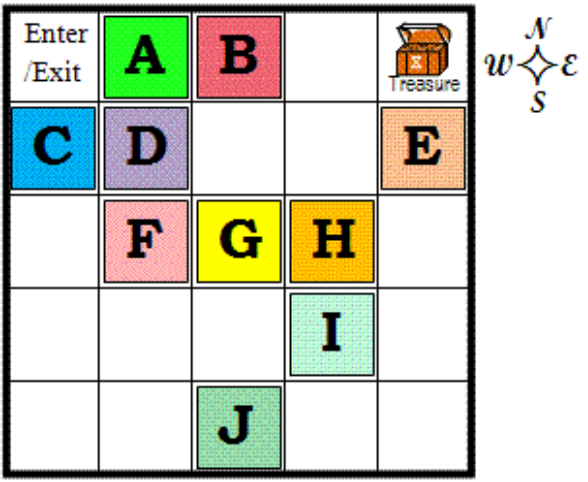
In 1895, three prospectors struck pay dirt in the Rand Mountains southwest of Death Valley. Before the claim was abandoned, mines produced gold valued at almost $25,000,000 (more than two billion dollars at today's prices). Sometimes valuable minerals can remain in abandoned sites because it is too dangerous or expensive to extract them. A cave-in can completely block access tunnels. This situation prompted the following puzzles.

To solve these puzzles, you must find your way from the Enter/Exit square (at the top left) to the treasure and back to the starting location. The shaded areas are huge blocks. You can push a block if there is an empty square on the other side of it. Neither you nor the blocks can move through the outside walls or through any block. When you move a block, it must move the entire length of a square.

Consider Puzzle 1 on the following page. Even if all of the other blocks were removed, you would never be able to move blocks A and B. There would always be a wall or another block on the other side of the block you are trying to push. Your first move must be to push block C south. As you work your way to the treasure, don't push block E north because you would bury the treasure forever. These puzzles are trickier that they seem at first glance.

43. Mine Cave-In Puzzle 1

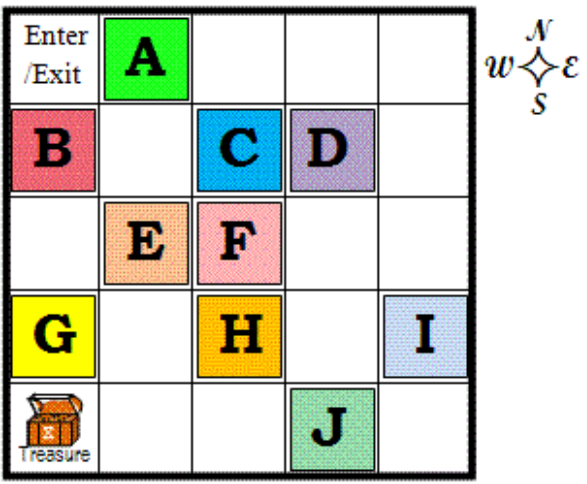
Push the blocks to make a path to the treasure and back.



Hint: p. 128 Answer: p. 167

44. Mine Cave-In Puzzle 2

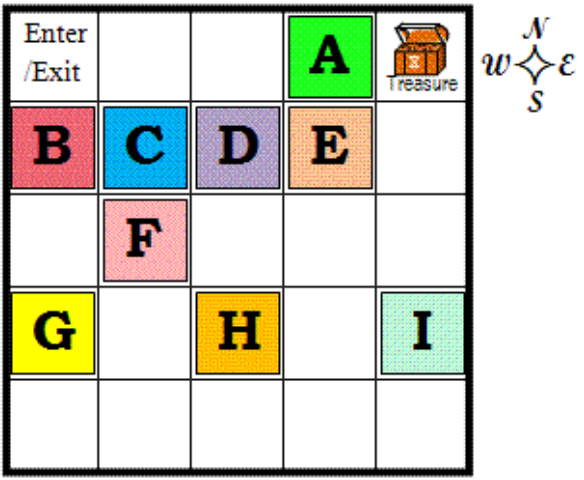
Push the blocks to make a path to the treasure and back.



Hint: p. 128 Answer: p. 167

45. Mine Cave-In Puzzle 3

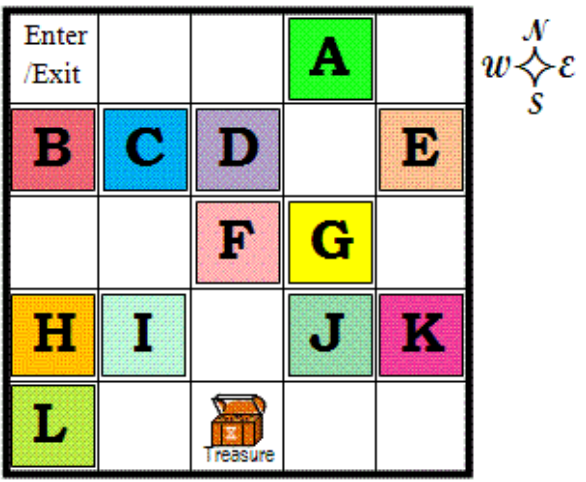
Push the blocks to make a path to the treasure and back.



Hint: p. 128 Answer: p. 167

46. Mine Cave-In Puzzle 4

Push the blocks to make a path to the treasure and back.



Hint: p. 128 Answer: p. 167

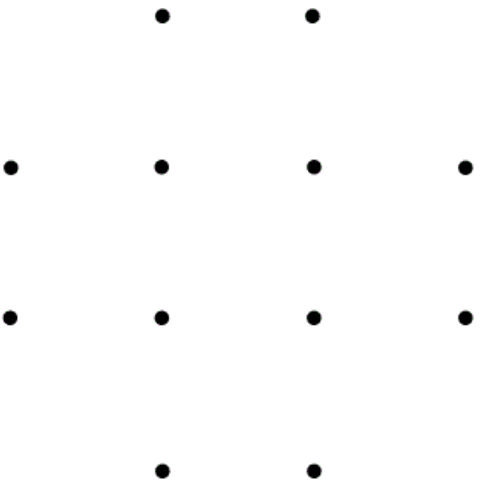
47. Square Claims

Calico Ghost Town, Barstow CA

When I was a teenager, my family staked a mining claim near the Calico ghost town. We had conducted some field studies that indicated deposits of silver were still in the area.

Federal law specifies that claim boundaries must be distinctly and clearly marked with a post at each corner. A minimum of four posts are needed to claim a square area. My brother and I were digging and pounding for half a day to establish our claim's boundaries. Note: It didn't make us rich.

Here is a classic puzzle straight from that experience. A 'dot square' is a set of four dots that form the corners of a square. How many dot squares can you find in the following diagram of 12 dots?



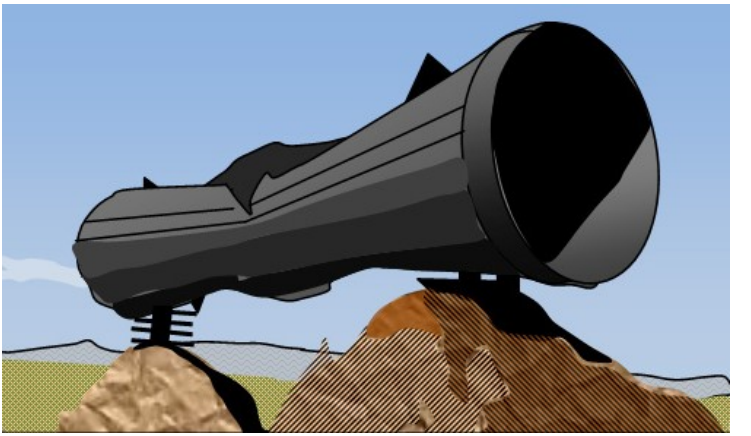
Hint: p. 128

Answer: p. 168

48. Hear Here

Mojave Megaphone, Baker CA

Baker, California, is a welcome oasis for travelers along Interstate 15 between Los Angeles and Las Vegas. It claims to have the world's tallest thermometer and to be the home of Alien Fresh Jerky (the dried meat product that ET phones home about). About 15 miles southwest of town bolted to the top of a hill stands the Mojave Megaphone. This mysterious metal cone is about 8 feet long.



No one knows for sure who built this structure or what its purpose was. Some have speculated that it was intended to amplify a hand-held siren used when the Army was testing chemical weapons during the early-to-mid 20th century. Others suggest it was used to advertise local tourist amenities.

Here are some announcements that might be broadcast through the megaphone. See if you can figure out what they are saying.

1. Deign germ ill it air eat estrange.
2. Seethe whirled stall Esther ma met her.
3. Wheel of high weigh dry verse inn bay cur.
4. Half Ewan joy daily injure key?
5. A choir ring few Lizzy sent shell lout hear.

Hint: p. 128 Answer: p. 168

49. Time and Space

Mojave Spaceport

Virgin Galactic is a company developing commercial spacecraft. Virgin's founder, Richard Branson, has used the Mojave Spaceport for testing his SpaceShipTwo suborbital spacecraft which is launched from beneath a carrier airplane known as White Knight Two. My reservation as a space tourist will have to wait for two things: 1) Virgin will need to work out all of the bugs in their design, and 2) this book will have to sell 2,000,000 copies so I can afford the ticket price.

This riddle is a charade. Your challenge is to find two words (referred to as 'my first' and 'my second') and put them together to form a third word (referred to as 'my whole'). For example, if my first = 'off' and my second = 'ice,' then my whole would be 'office.'

My first is present – future's past –
A time in which your lot is cast.

My second is my first of space
Defining people's present place.

My whole describes a lack of site –
A place without length, breadth, or height.

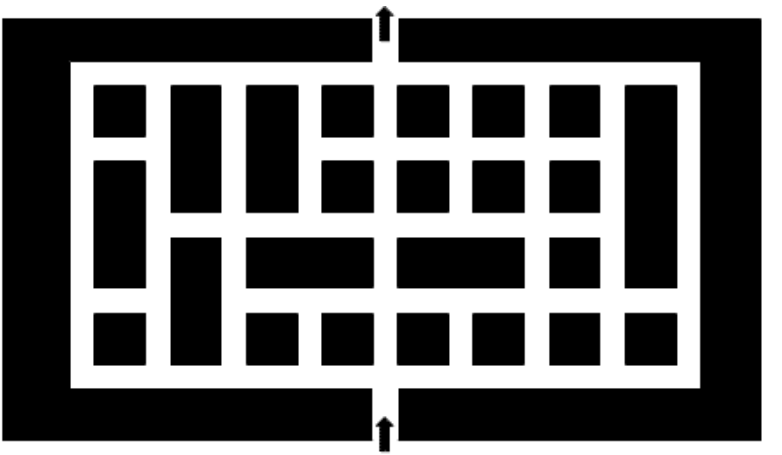
Hint: p. 128

Answer: p. 168

50. Turn, Turn, Turn Residential Streets, Rancho Seco CA

Rancho Seco is a small patch of checkerboard streets between Mojave and Red Rock Canyon. Wikipedia describes it as "an unincorporated community in Kern County 2 miles south-southwest of Cantil." (I wonder if Wikipedia's entry for Cantil describes it as 2 miles north-northeast of Rancho Seco?) The following maze looks very much like the layout of the Rancho Seco streets.

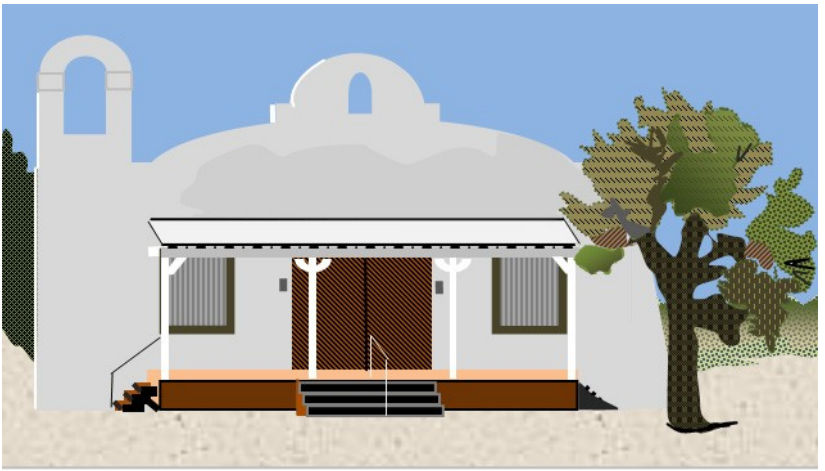
Enter the maze at the lower arrow and exit the maze at the upper arrow. Each time you come to an intersection you must not continue straight ahead; you must turn either right or left. You must never make a U-turn or move in reverse. If you find an answer quickly, check to make sure you haven't missed a chance to turn somewhere.



Hint: p. 129 Answer: p. 169

51. Mark 10:31

Kill Bill Church, Hi Vista CA



The Twin Pines chapel in Hi Vista, California, appeared as the backdrop for a murder scene in the movie ***Kill Bill***. Originally built as the Hi Vista Community Hall, it was given a mission-style facade for the movie ***True Confessions*** in 1981. Frequently used as a filming location, the chapel has actually become a church as well.

Hi Vista is south of Edwards Air Force Base in the extreme northeast corner of Los Angeles County.

Now for the puzzle...

What unusual characteristic do these words have in common?

aide ate ear eels ether free gelatin
heart height lease now rancho ruse scares
sexist sunblock thin tough trio

Hint: p. 129

Answer: p. 169

52. State the Headlines

Headliners in Las Vegas NV

Las Vegas is renowned for its fabulous entertainers. Its headliners include musicians, comedians, magicians, and several Cirque du Soleil shows. If you still have any money after visiting the casinos, you can spend the rest on dozens of top quality acts.

This puzzle features a few fictitious newspaper headlines. What highly unusual characteristic do each of the words in the following headlines share?

MOMS DEMAND FLORAL MEMORIAL IN MAINLAND GALA

LASCAR INKS MANDARIN COAL MINE DEAL

ARCADE GAME INCOME GAIN ALARMS MAMA

COOK MADE CALAMARI OR MAHI MAHI MEAL

MARINE ARMS LAND MINE IN DEMO

Hint: p. 129 Answer: p. 169

53. Even Three Times

The Hangar, Lancaster CA

The Lancaster JetHawks are the Class A-Advanced affiliate of the Colorado Rockies. This minor league baseball team plays its home games at a stadium called The Hangar. The aviation references come from Lancaster's association with the aerospace industry.

Baseball is a game of numbers: batting averages, pitching statistics, hits, runs, and errors. The games seem to be structured around the number 3. Three strikes and you're out. Three outs retire a side. So the number 3 is the only odd number we'll allow in this puzzle.

Replace the letters in the following multiplication with the five digits 0, 2, 4, 6, and 8 so that the calculation is correct. Each letter stands for a different digit.

$$\begin{array}{r} \mathbf{AB} \\ \times\ \mathbf{3} \\ \hline \mathbf{CDE} \end{array}$$

Hint: p. 129

Answer: p. 170

54. Grow from the Middle

Joshua Trees

The Joshua tree is the iconic emblem of the Mojave Desert. Some say that Mormon settlers named it for the Bible prophet Joshua raising his arms in prayer. The plant is neither a tree nor a cactus. It is a species of Yucca (a member of the lily family). After a stalk flowers and the blossoms fall off, new branches grow out in a completely different direction from that spot. The sharp, dagger-like leaves minimize evaporation and channel rainfall into the plant.

Hardwood trees develop growth rings because the only growth occurs at the living exterior of the plant. The trunk and branches of a Joshua tree grow from the inside. The result is a surprisingly lightweight structure.

In the 1920s a land developer took pictures of Joshua trees with oranges stuck on the branches in the hope that Eastern buyers would think they were looking at citrus orchards.

The same two-letter combination can be put into the center of each of the following words to form a six-letter word. For example, you could put "sp" in the center of 'veer' to form vesper, but it won't work for the other words. What is the only two-letter combination that works for all six cases?

fist	host	liar
pals	veer	wiry

Hint: p. 129

Answer: p. 170

55. River-Hidden-River

Mojave River CA

The Mojave River has a long history with Serrano Native Americans, Spanish Explorers, Mormon pioneers, and other desert dwellers. And yet, hikers rarely see it. The river can be seen near its source in the San Bernardino Mountains and near its terminus in the wash that feeds into the (usually dry) Soda Lake. But most of the river's flow is underground; the midsection of the river remains unseen.

Each of the six-letter words in this puzzle has the two middle letters missing. The same two letters are missing from the three words in each numbered set. Determine what two letters are missing from each set.

For example, consider these three words:

B R _ _ S E F R _ _ T Y S Q _ _ R M

Insert "UI" into each word to form bruise, fruity, and squirm.

1.
M A _ _ E T
S I _ _ A L
C O _ _ A C

2.
A L _ _ N S
S P _ _ O T
F R _ _ I D

3.
S T _ _ L E
T E _ _ O T
D I _ _ E R

4.
S U _ _ E R
B A _ _ L Y
E A _ _ U L

5.
B U _ _ R S
P A _ _ E S
V O _ _ U R

6.
C O _ _ L E
E R _ _ T S
T O _ _ E E

7.
S O _ _ E D
P E _ _ I C
W O _ _ E S

8.
S E _ _ R E
L O _ _ S T
O C _ _ P Y

Hint: p. 129

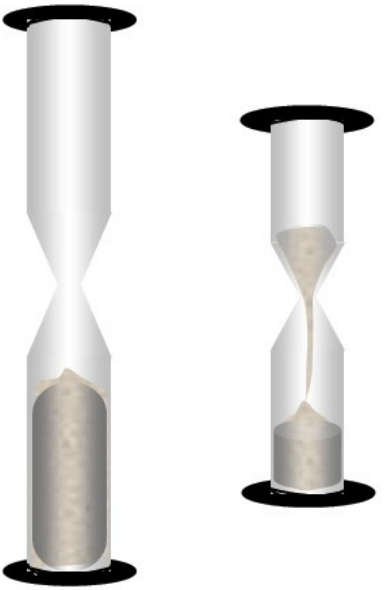
Answer: p. 170

56. Shifting Sands

Newberry Springs CA

The isolated desert community of Newberry Springs should perhaps be renamed New Bury Springs. Homeowners fight a constant battle with shifting sands. The dunes try to bury houses, outbuildings, and everything else. Sometimes those sands succeed. See if you can get the sands in this puzzle to work for you.

You have two hourglasses: one that measures exactly 4 minutes and one that measures exactly 7 minutes. They don't have any markings indicating individual minutes or fractions of minutes (just 4 and 7). You wish to measure exactly 9 minutes. Both hourglasses have been standing upright for a long time. How would you use these two hourglasses to measure 9 minutes?



If you find an answer that requires you to delay the 9-minute timing, try answering it again without any time delay. Your time starts now.

Bonus challenge: Find a way to measure exactly 10 minutes using the same timers.

Hint: p. 130 Answer: p. 170

57. Front-End Loading

Air Force Plant 42, Palmdale CA

When aerospace contractor Northrop Grumman planned the new B-21 Raider, they did front-end loading. Long life cycle projects can involve billions of dollars. The closer a complex system gets to completion, the harder it is to incorporate changes. Therefore, the designers want to be sure they have optimized their approach early in the project. This is called "front-end loading."

Your challenge is much easier. Your front-end loading involves putting a 2-letter word in front of some given words. Place a 2-letter word in front of each of these words to form a new word. The same 2-letter word will be used for each of the words on a line.

1. zen, cent, gear, sage, nation
2. ore, rift, visor, equate, dressed, mission
3. gun, half, aches, droll, quest
4. me, lid, lace, rely, used
5. ad, at, of, on, sling
6. pen, sail, under, sorted
7. not, thy, lots, racy, tying, voting

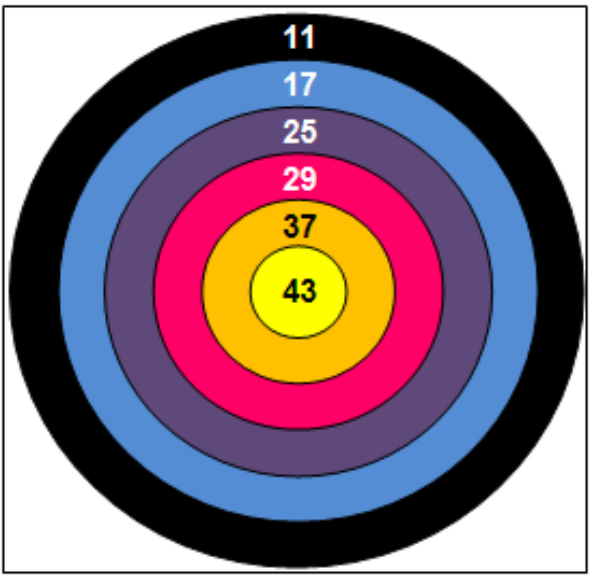
Hint: p. 130 Answer: p. 171

58. Target Ninety-Nine

Open Desert Archery Range

The open desert is a great place to attach a target to a bale of straw and practice firing some arrows. I recommend that your arrows have brightly colored shafts and/or fletching so they are easier to find in the unlikely event that you miss the target. Be sure to stay hydrated.

Shoot four arrows at the target and score exactly 99 points.



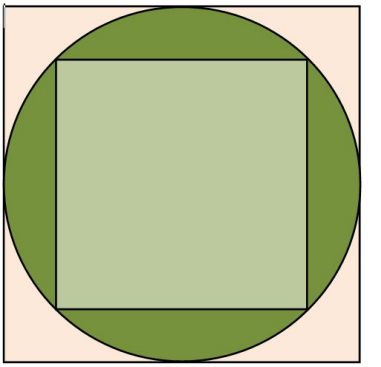
Hint: p. 130

Answer: p. 171

59. Crop Circle/Squares

Barstow-Daggett Agriculture

The area around the Barstow-Daggett Airport supports some limited farming in the middle of the Mojave Desert. Of course, the crops require irrigation. The farmers use center pivot irrigation systems. When viewed from above, the cultivated areas appear as big green circles in the midst of square desert tracts.



This puzzle involves circles and squares. The area of the large square is 100. You are asked to determine the area of the small square. Be aware that it is possible to solve this puzzle without algebra and without the Pythagorean Theorem. Try to find the simple method for solving it.

Hint: p. 131 Answer: p. 172

60. Four Card Logic

Senior Center, Palmdale CA

Most of the active seniors at Palmdale's Legacy Commons are sharp, but Walter Mellon isn't playing with a full deck. He creates these little logic problems to keep his friends on their toes.

Four cards are removed from a standard deck of 52 playing cards and arranged in order of increasing value left to right.

1. The club is not a queen.
2. There are no aces, but there is a red five.
3. The second and third cards are the only diamonds.
4. At least one of the two face cards is a queen.
5. One of the non-face cards has a value that is 4 higher than the other.

What are the values and suits of the four cards?

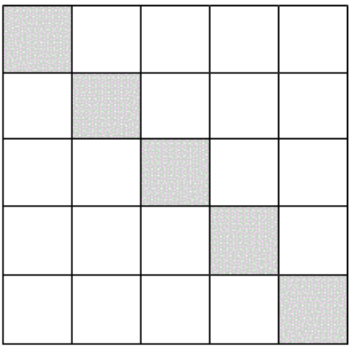
Hint: p. 131 Answer: p. 172

61. Anagram Quints

Barker Ranch, Death Valley

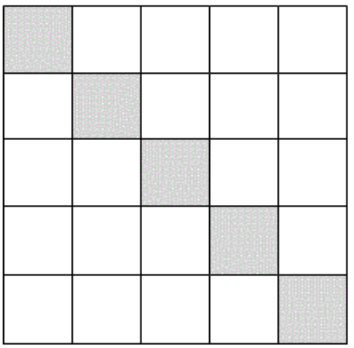
Notorious serial killer Charles Manson and his "family" of followers once holed up at Barker Ranch in Death Valley National Monument. Sheriffs even arrested Manson at the ranch on suspicion of vandalism, but the police were unaware of his greater crimes. He was a cult leader with an evil, chaotic mind. It's about time for all of us to think more pleasant, ordered thoughts. Consider this puzzle.

Rearrange the letters of each of the words and write those letters into the white squares on the same line as the word. Fill the 5 shaded squares with the same letter such that each row spells a common 5-letter word.



MEAL
SAYS
RAZE
OGLE
RUSH

Now try with a different letter and another set of words.



HART
RODS
LOVE
CORD
ROAR

Hint: p. 131

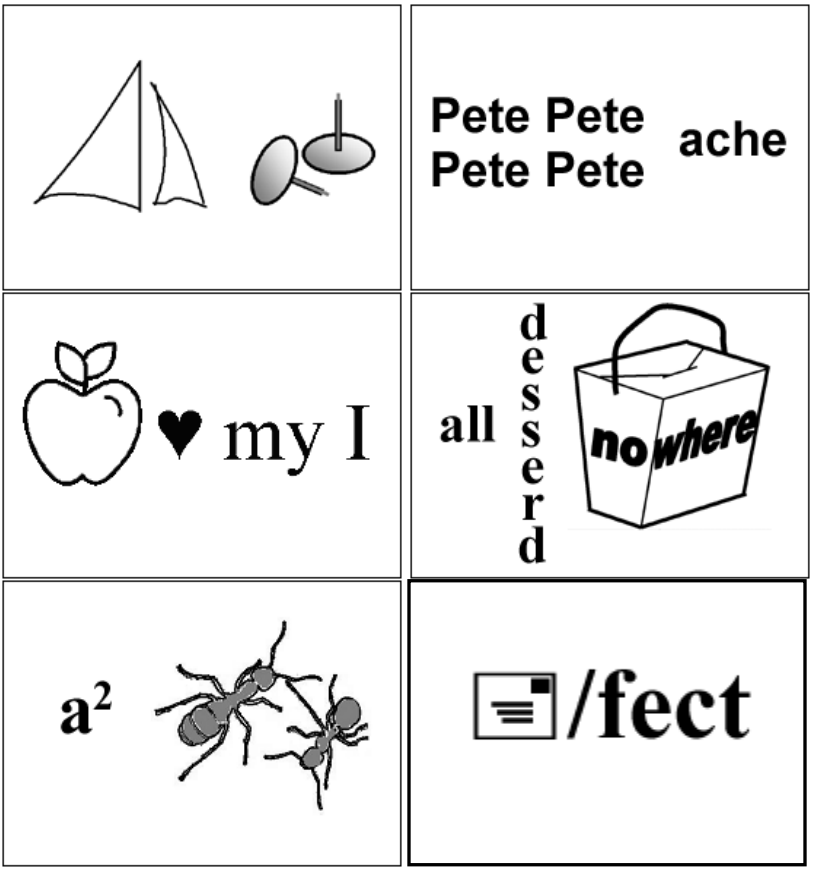
Answer: p. 173

62. Boxed Rebus Puzzles 1

Railroad Boxcar Graffiti

The Union Pacific and BNSF railroads chug through the Mojave Desert carrying graffiti on almost every freight car. The artwork is colorful, imaginative, and wild, but it doesn't do a very good job of communicating its intended message to the general public.

Rebus puzzles are like that. A phrase is hidden in each of the boxes below. For example, if you saw **10SNE1**, it could be read as "Tennis anyone?" See if you can decipher what each rebus is saying.

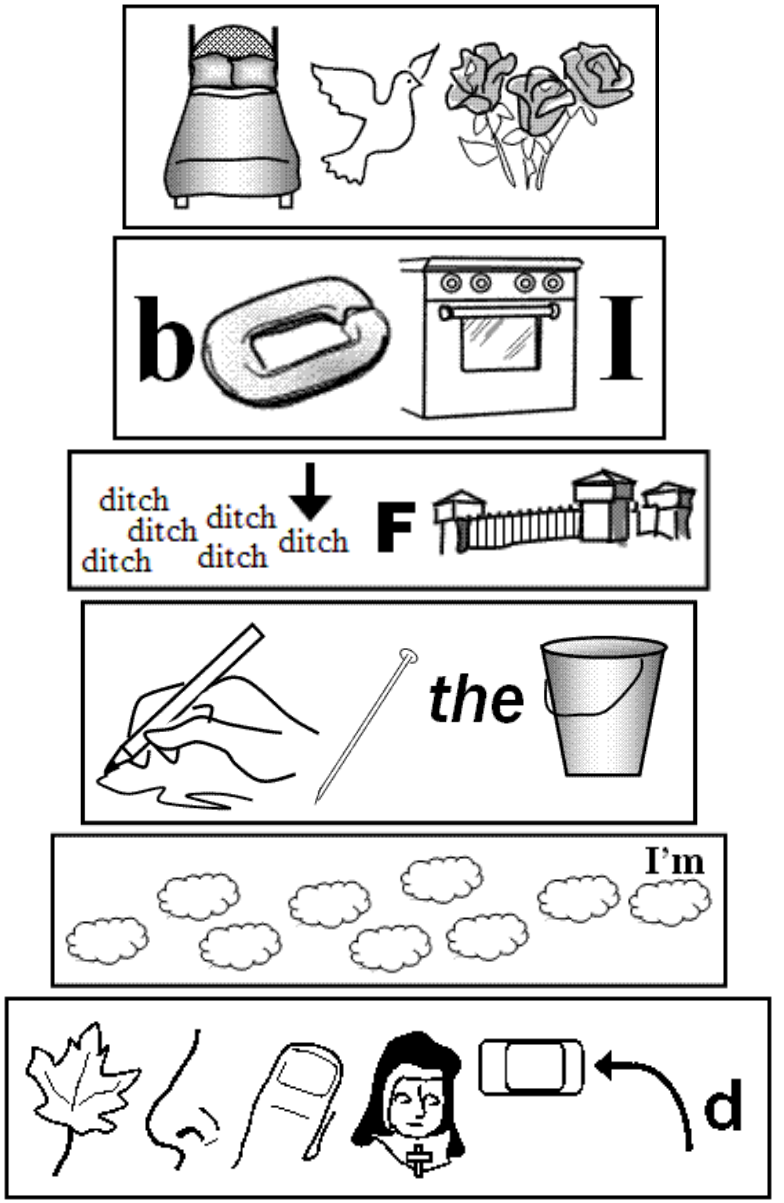


Hint: p. 131

Answer: p. 173

63. Boxed Rebus Puzzles 2

Railroad Boxcar Graffiti



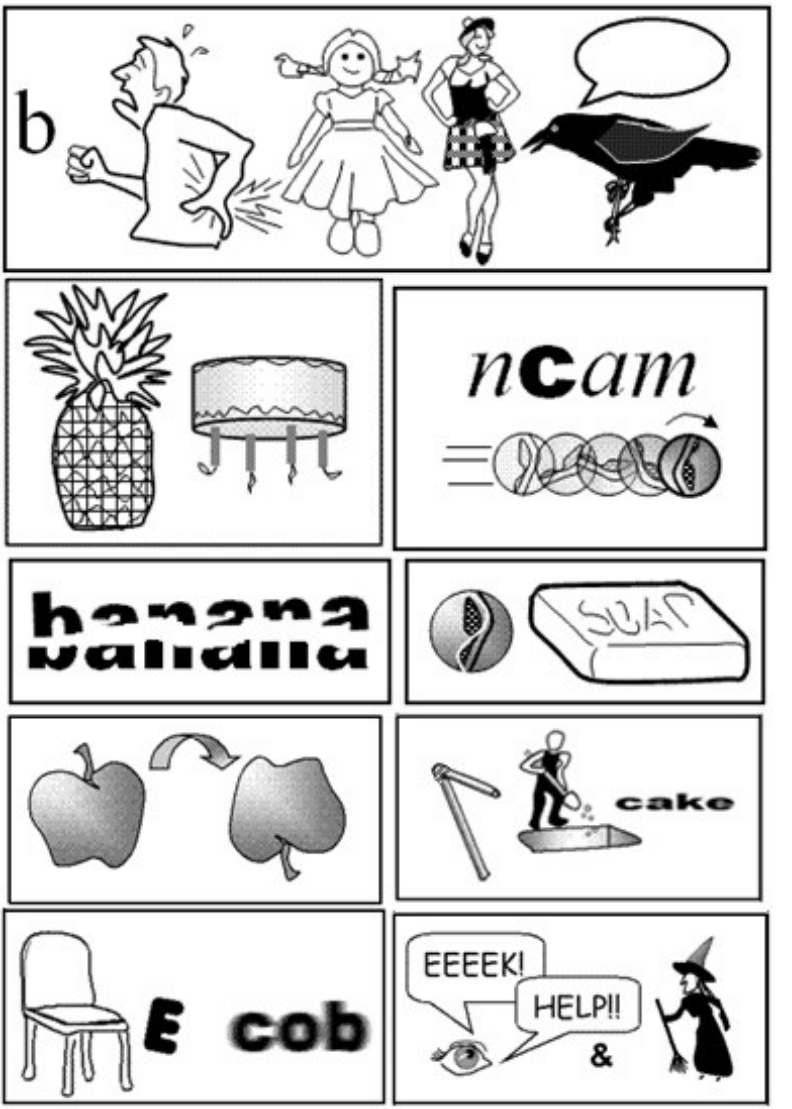
Hint: p. 131

Answer: p. 173

64. Rebus Category 1

Railroad Boxcar Graffiti

Each of the puzzles in this section has an answer that falls into the same category. The job gets easier if you guess the category.



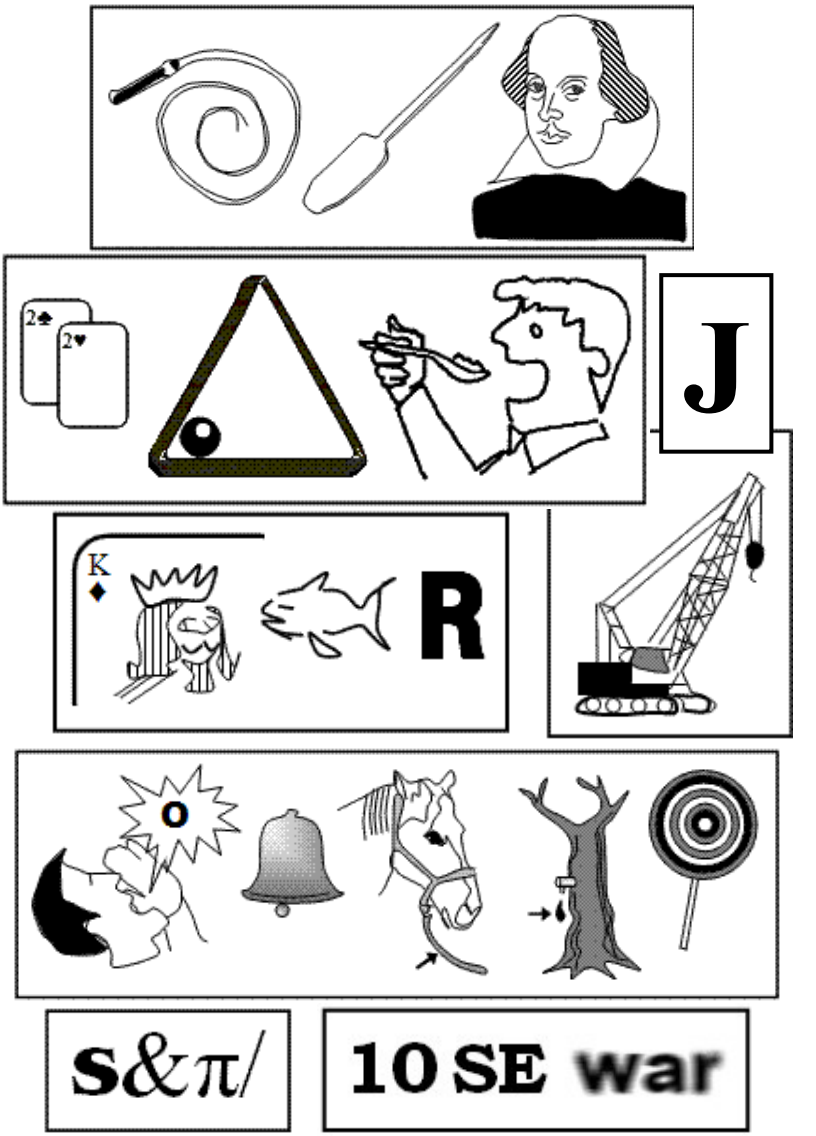
Hint: p. 132

Answer: p. 174

65. Rebus Category 2

Railroad Boxcar Graffiti

Each of the puzzles in this section has an answer that falls into the same category. The job gets easier if you guess the category.



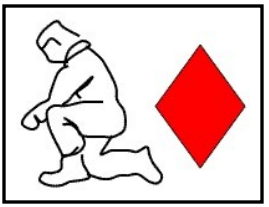
Hint: p. 132

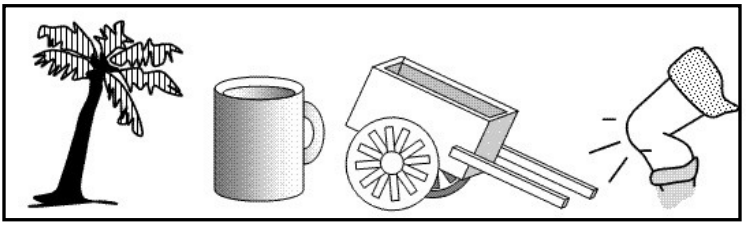
Answer: p. 174

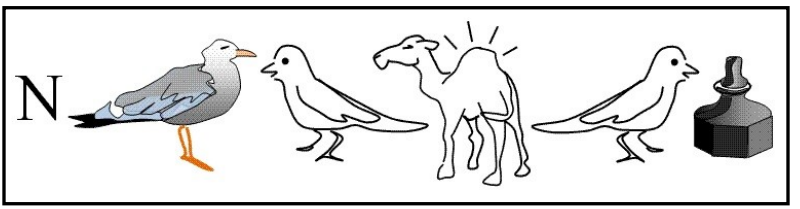
66. Rebus Category 3

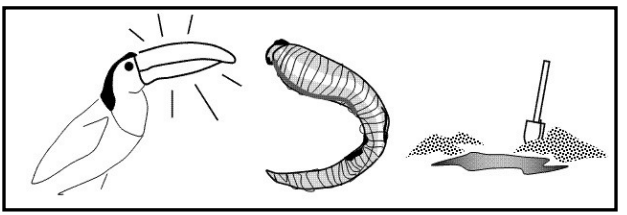
Railroad Boxcar Graffiti

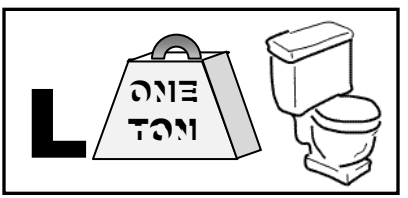
Each of the puzzles in this section has an answer that falls into the same category. The job gets easier if you guess the category.











Hint: p. 132

Answer: p. 174

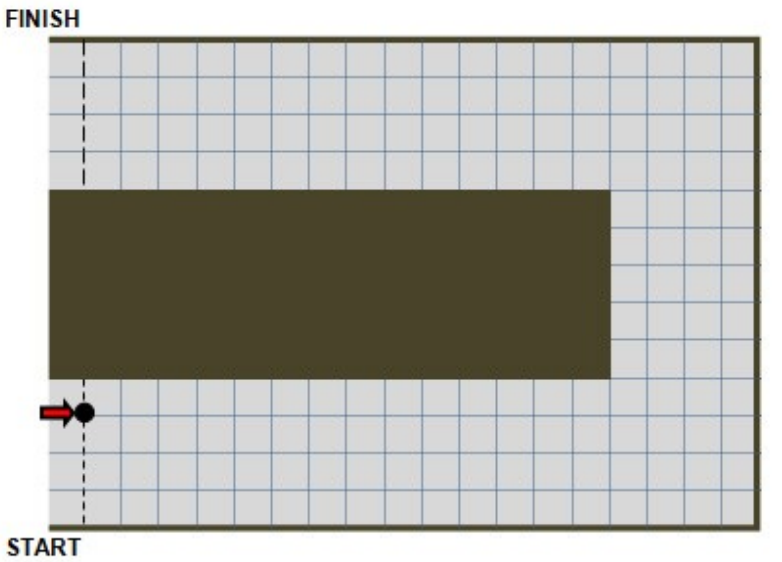
67. Speedway

Willow Springs International Raceway

Founded in 1952, with substantial elevation changes and high average speeds, Willow Springs has become one of the fastest and most challenging tracks in the U.S.

In this puzzle your car is at the arrow pointing to the east. Your job is to drive on the track (grid) from the start to the finish in the fewest 'moves'. You start with speed = 0. Before each move you can change your speed by 0, 1, or 2 squares per second in both the east-west and the north-south directions. Then you move for one second at the speed(s) and direction(s) you've chosen.

You'll want to set your speed at 2 squares east on your first move to build your speed on the straightaway. You can't go north yet because you would hit the center barrier, but you could go south as well as east. You can slow your speed by changing (1 or 2 squares per second) in the opposite direction. Stay within the grid at all times. Watch your speed, but feel free to hit the finish line at high speed. Assume that there is plenty of track to the west for you to slow to a stop. Our answer completes the course in 9 moves.



Hint: p. 132 Answer: p. 175

68. Primer Subject Desert Knolls Elementary, Apple Valley CA

I started school in the 1950s. My first textbook was a primer, and English was the first subject the school focused on. (Is it OK to end a sentence with a preposition?) But I was more interested in TV westerns with Roy Rogers and Dale Evans. When Roy's "wonder horse" Trigger died, they say that Roy had the animal stuffed and put on display in his Apple Valley museum. Ah, a great part of Americana lost. It's time for another puzzle.

What unusual characteristic do these words share?

desert, does, dove, entrance, invalid, minute, refuse, sow, wound

Hint: p. 132 Answer: p. 176

69. Crash Course Holiday Traffic on Road Trip to Vegas

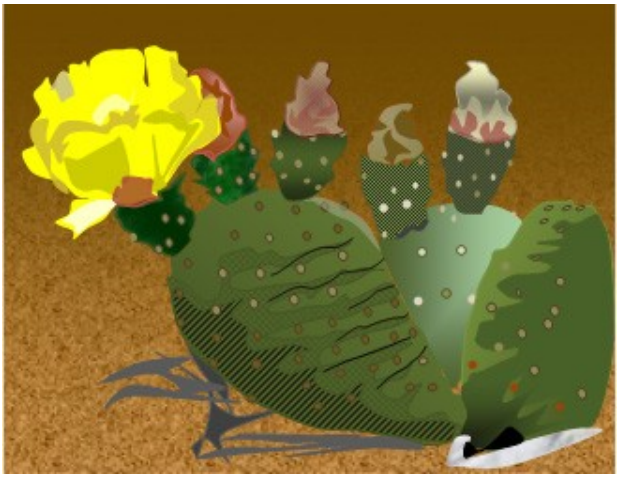
Interstate 15 between Barstow and Las Vegas is generally wide open, but drivers can experience major congestion on a holiday weekend. Be patient – there is no alternate route.

Jeff is traveling very fast. The traffic immediately to his right and left is exactly matching his speed. Suddenly a large bird drops directly into Jeff's path. If Jeff steers right or left, he'll crash into one of the vehicles at his side. The bird is unaware that it is about to be overtaken (and hit at high speed), so it does nothing to avoid the collision. Jeff can't change his speed or stop in time, but he still manages to steer clear of the bird. How does he manage to avoid any collision?

Hint: p. 132 Answer: p. 176

70. Prickly Pairs

Prickly Pear Cactus



Prickly pear is a well-known genus of the cactus family. Its paddle-like branches are large, spine-covered pads that have earned it the nickname of beavertail. Showy flowers, mostly yellow and red, develop into knobby fruit resembling pears. Both the pears and the pads are edible. Leave the spines.

Group the following words into six logical pairs:

age for rain spray
cell ice sale tax
dance phone sea use

Then group these words into six logical pairs:

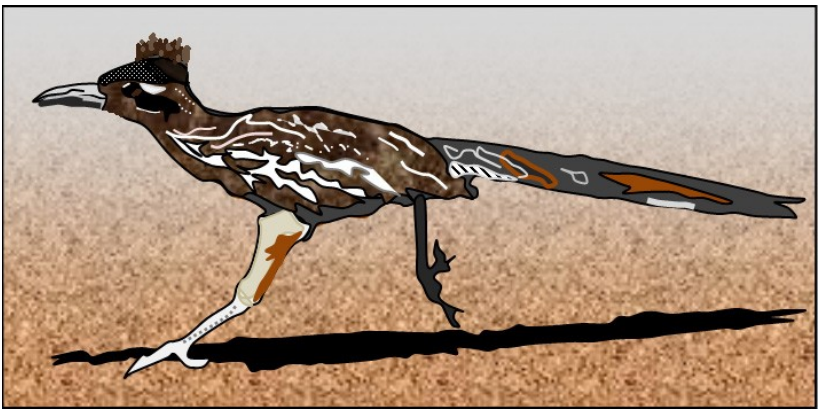
ail ants cease eye
force own prey reigned
sage self stacks you

Hint: p. 133

Answer: p. 176

71. Equation

Roadrunner



The hard-working scientists and engineers at Acme are always working to support a certain coyote in his quest to capture a certain roadrunner. They are currently working on this problem:

Find two ***different integers*** (x and y) where x times y = x minus y.

Hint: p. 133 Answer: p. 177

72. Sequence 24

Edwards Air Force Base

Edwards Air Force Base has a notice on the wall showing Air Force officer ranks in order of increasing importance.

> Second Lieutenant, First Lieutenant, Captain, Major, Lieutenant Colonel, Colonel, Brigadier General, Major General, Lieutenant General, General, and General of the Air Force

They also have a poster where the following sequence could be seen.

OND UES EDN HUR RID ATU

What is the next three-letter entry in the sequence?

Hint: p. 133 Answer: p. 177

Part 4: Rattlers

Rattlesnakes roam the deserts and hillsides of the western United States. I have encountered rattlers about five or six times while hiking in Southern California. Once, when I was a crazy kid, I even joined a few friends on a rattlesnake hunt. We actually caught and killed one. Then we cut it up and cooked it in our campfire. It was pretty fair eating. It tasted like... well, you know.

The best thing about rattlesnakes is that they rattle. They are kind enough to warn you that they are about to strike. Of course that doesn't help you if you are wearing ear buds and are rocking out to your favorite tunes. We are putting you on notice that these brainteasers are somewhat more difficult than those that have come before.

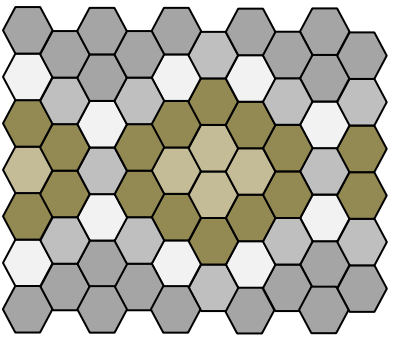
But try not to get rattled.

As always, if you find yourself stymied, consider reading the Hints section found after the puzzles. The Answers section can serve as your snakebite kit. We don't want any injuries.

73. Hex Checkers

I'm told you can distinguish a Mojave Green from a Western Diamondback by the scale patterns on their backs. But if so, you are probably too close. I've never stumbled upon a Mojave Green rattlesnake in the wild, but the pattern of scales on their backs inspired this puzzle.

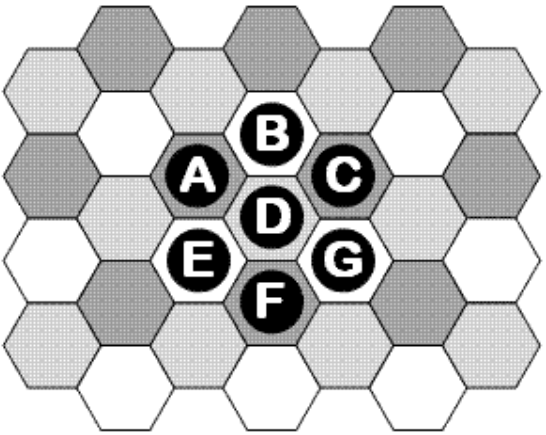
Mojave Green Rattlesnake Skin



A sort of checkerboard made of hexagons is shown below with seven playing pieces in the center. The pieces (shown as lettered circles) act something like 'kings' in checkers; they can move in any of the six directions defined by the hex grid. A piece can step into any adjacent hexagon or jump over an adjacent piece (removing the jumped piece from the board) as long as it ends in an empty cell.

For example, A could jump B or E, or A could step into any of the empty hexagons above or to the left. As in checkers, a piece can continue jumping as long as the opportunity remains. Unlike checkers, a piece isn't **required** to jump if the opportunity exists.

The object of the puzzle is to end with only one piece left on the board – in the center hexagon (where the D is at the start). And you are to do all of that in the fewest number of moves. A move consists of a step to an empty adjacent hexagon or a series of jumps by the same piece.



Hint: p. 134 Answer: p. 178

74. Summer Squares 100 49 Palms Oasis, Joshua Tree NP

An interpretive sign at Joshua Tree National Park's 49 Palms Oasis claims that the stand of fan palms there is the northernmost extent of naturally occurring palms in North America. Some east coast sites make a similar claim. Maybe they are right.

Incidentally, one of the times I encountered a rattlesnake I was exploring an oasis in Joshua Tree National Park.

I didn't count the palms at the 49 Palms Oasis, but if there are indeed 49 of them, their number is a perfect square (7 times 7 = 49). As you know, 100 is the square of the integer 10.

1. Express 100 as the sum of the squares of two different integers.
2. Now express 100 as the sum of the squares of five different integers.

Here are two tougher challenges:

3. Express 100 as the sum of the squares of three different integers.
4. Finally, express 100 as the sum of the squares of four different integers.

Hint: p. 134 Answer: p. 178

75. Coaster Challenge

Cocktail Lounge, Pahrump NV

Dawn O'Day poses a puzzle for her friend Earl E. Byrd as they relax in a cocktail lounge in Pahrump, Nevada. Six coasters are arranged in a straight line on a tabletop as shown. Dawn challenges Earl to rearrange the coasters to form the second layout (alternating colors and rotating some symbols) as shown below. Earl must perform the transformation in the fewest 'moves' possible.

A move consists of sliding and/or rotating any two adjacent coasters without affecting the other four coasters. Adjacent coasters share a common side and almost touch each other. Dawn says, "You can slide a coaster pair or rotate a coaster pair as long as they stay on the tabletop and are moved as a single unit, like the two halves of a domino."

Starting Position

Slide

Rotate

Ending Position

Hint: p. 134

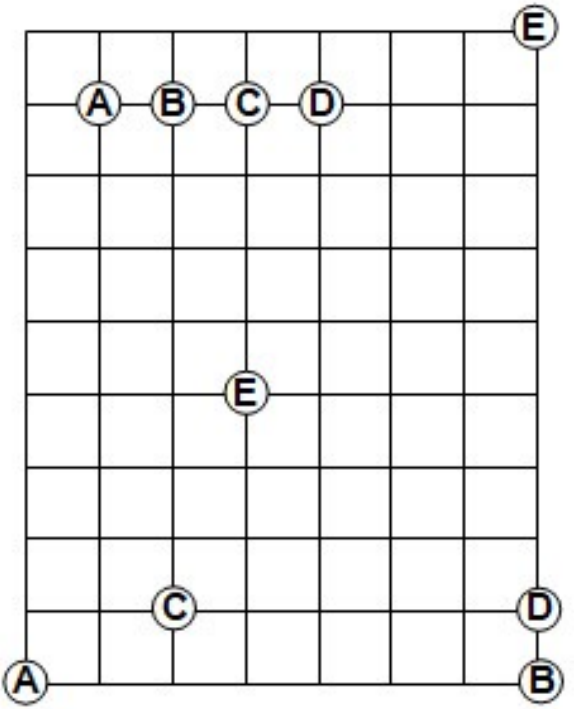
Answer: p. 179

76. Circuit Board

Consumer Electronics Show

The Consumer Technology Association holds the annual Consumer Electronics Show at the Las Vegas Convention Center in January. Who attends this annual trade show? Anybody who is anybody (and lots of folks who aren't 'anybody'). The sponsors claim it is "the most influential tech event in the world." I've been there; it is truly spectacular.

It all started with circuit boards and transistors and integrated circuits, and now **everything** has a computer and an IP address. It boggles the mind. But let's keep it simple. Imagine that this grid is a circuit board. Connect like letters (A to A, B to B, etc.) by tracing connections along the grid lines (and only along the grid lines). Paths may not cross each other or share the same section of the grid.



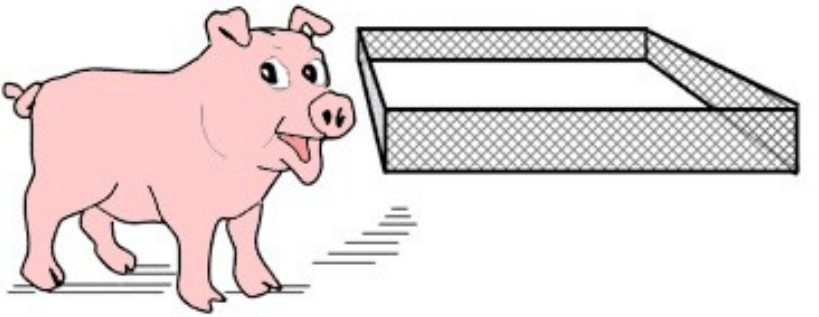
Hint: p. 134

Answer: p. 180

77. Five Little Pigs

Antelope Valley Fair, Lancaster CA

The Antelope Valley Fair attracts members of 4-H Clubs and Future Farmers of America. Livestock are judged and auctioned.



A farmer has five pigs in a large, square enclosure. He wants to partition the square into five separate areas so that each pig can have a space away from the other four. The supply store has a terrific sale on prefab enclosures right now. The enclosures can be any size, but their shape is always square. How can the farmer add one new, square enclosure to his existing square enclosure so that each of the five pigs can be isolated in an enclosed area of its own?

Hint: p. 134 Answer: p. 180

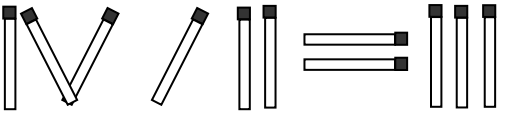
78. Matchstick Math – Roman Numerals

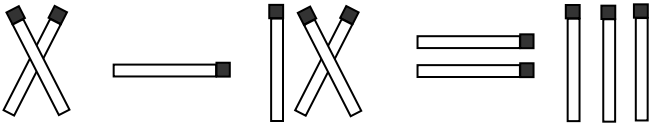
Searchlight NV

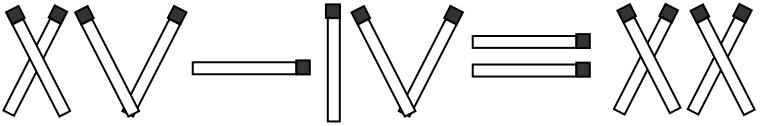
In 1897, a gold prospector named George Frederick Colton is said to have discovered gold when he was lighting a Searchlight brand match: hence the name of the town of Searchlight. Smoking is, of course, hazardous to your health, and brush fires can wreak havoc even to the sparse vegetation of the desert. So we have a better use for matchsticks.

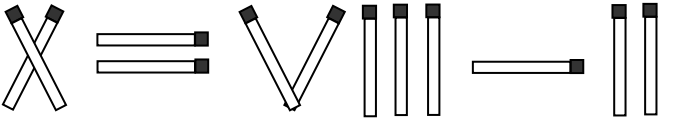
In matchstick math you are presented with an incorrect equation and asked to make it right by moving exactly one match. You may not drop a match diagonally across the equal sign to make it a not-equal sign (≠). Your task is to correct the equation by moving (and not removing) exactly one match in the following examples.

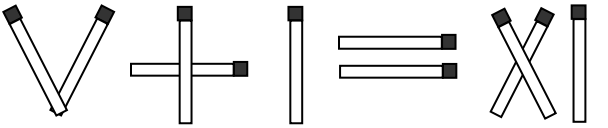
Hint: p. 135 Answer: p. 180

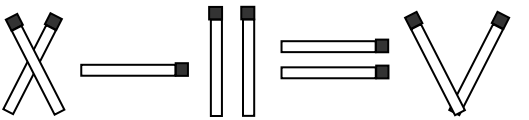
1. 

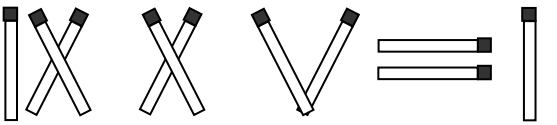
2. 

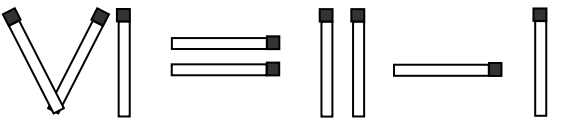
3. 

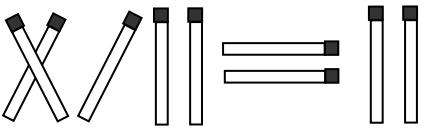
4. 

5. 

6. 

7. 

8. 

9. 

79. Fill Two Blanks Twice

California City CA

The three largest cities in California (by area) are Los Angeles, San Diego, and California City. Lonely Cal City covers 204 square miles and is home to only 14,000 people; that's a population density of 69 people per square mile. If you're looking for land to build your dream house, you'll find lots of vacant lots in Cal City.

This puzzle also has lots of vacant lots. You are asked to fill in two blanks per word – twice.

Supply two different letters to fill the blanks and form a word. Then fill the blanks with two different letters to form a second word. All four letters must be different. For example, the fifth word cannot be SUMMIT. The four letters may repeat letters given in the puzzle; for example, you could use O, L, U, or M as one of your letters in the first puzzle. When you are finished, you will have used every letter of the alphabet at least once.

1.	_	O	L	U	M	_	2.	F	_	E	E	_	E
3.	_	H	R	A	S	_	4.	N	E	_	H	E	_
5.	S	U	_	_	I	T	6.	_	E	_	U	E	L
7.	_	_	Y	O	U	S	8.	J	_	N	_	E	D
9.	G	R	O	_	_	H	10.	S	_	N	T	A	_
11.	_	N	_	I	S	T	12.	S	A	_	A	_	I
13.	_	E	_	U	T	Y	14.	_	R	O	_	E	L
15.	B	E	_	_	A	N	16.	E	R	_	A	T	_
17.	R	_	S	_	U	E	18.	S	_	R	_	E	T
19.	U	N	_	O	_	S	20.	B	_	A	R	_	S

Hint: p. 135

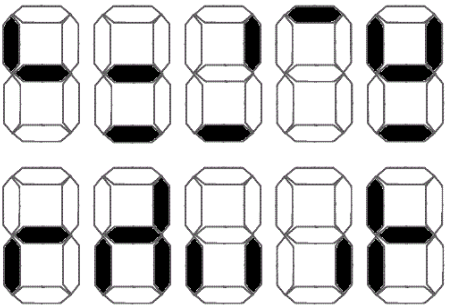
Answer: p. 182

80. Faulty Calculator

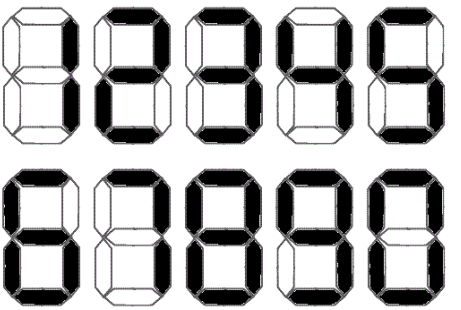
San Andreas & Garlock Faults

The Mojave Desert is crisscrossed with two major faults and numerous minor faults. Both the San Andreas and the Garlock faults are overdue for powerful earthquakes. Who knows how much harm will be done if one or both of them should rupture? Get your calculators ready to tally the damage.

A simple digital calculator uses seven segments to display each digit. When all seven segments are "on", the digit displayed is 8. When only the two segments on the right are "on", a 1 is displayed. The illustration shows each digit 0 through 9 exactly once. The problem is that many of the segments are broken. When the broken segments are turned on, they don't darken the way they are supposed to. Your puzzle is to identify all ten digits.



Here is what the ten digits look like when the display is working properly. Of course, the puzzle displays the digits in a different sequence.



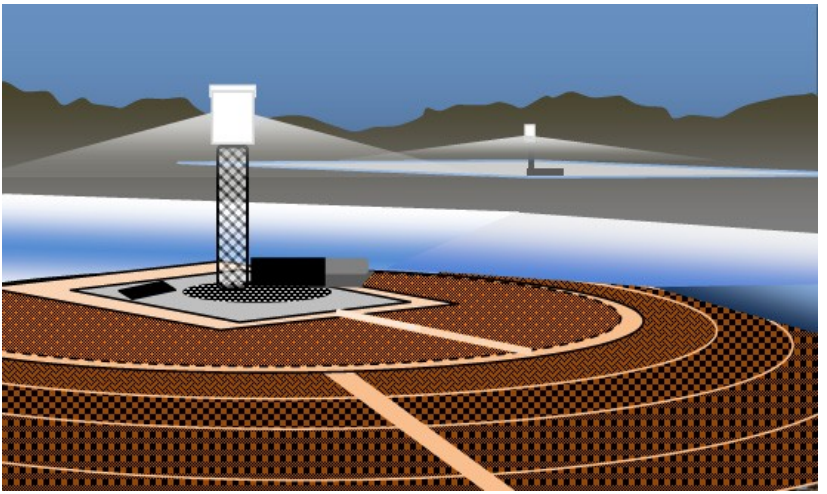
Hint: p. 135

Answer: p. 183

81. Eclipse Image

Ivanpah Solar Power Station

The world's largest solar thermal power plant lies at the base of Clark Mountain just across the border from Primm, Nevada. More than 300,000 mirrors focus the sun's rays to boil water and produce electrical power (392 megawatts). Nearby desert tortoises were issued sunglasses.

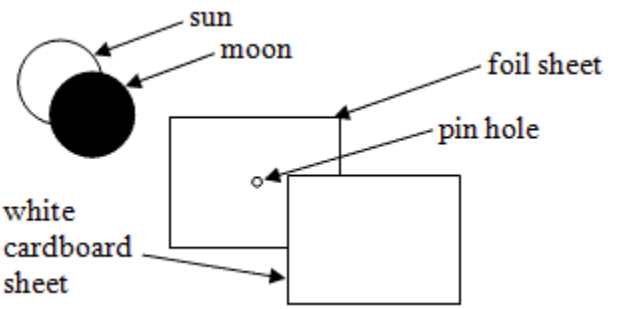


The sun also has the power to inspire awe in those who witness an eclipse.

In 2012, the daring, young Richard Price traveled (past the Ivanpah Solar Power Station) to southwestern Utah to view an annular solar eclipse. In an annular eclipse the moon never completely covers the sun, so observers must use one of two methods to view the event.

1. You can look directly at the sun through a solar filter. The filter is so dark that all you can see when you look through it is the disk of the sun (partially covered by the moon). About halfway to totality you see something like this:

2. You have a pin hole viewing apparatus. The sunlight passes through a pin hole in a piece of foil and 'projects' an image of the disk of the sun (partially covered by the moon) on a section of white cardboard. You look at the cardboard (facing away from the sun) to view the progress of the eclipse. The pin hole acts sort of like a camera lens focusing an image on the cardboard. The following diagram shows the set-up looking toward the sun; to see the image on the cardboard, you would have to be on the other side of the cardboard looking away from the sun.



And now for the puzzle that Richard Price proved by actually witnessing and photographing the situation.

You look through the filter at the sun and see that the moon has cut into the sun's disk from the lower right-hand corner (we'll call it 4:30 if you imagine the sun as a clock face). If you look at the image on the white cardboard sheet (with the sun at your back), at what clock position will you see the bite removed from the sun's disk?

a. 1:30 b. 4:30 c. 7:30 d. 10:30

Hint: p. 136 Answer: p. 184

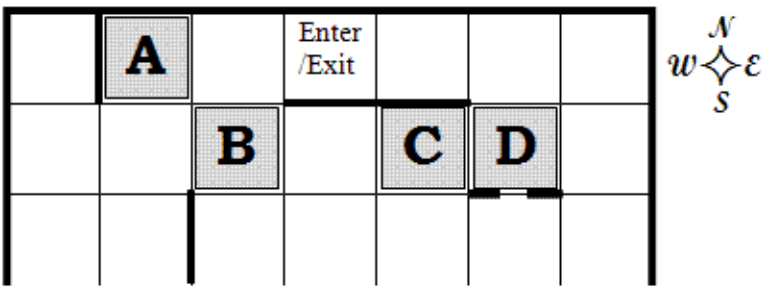
Mined Blocks

Oatman AZ

In its time, Oatman, Arizona, generated $40 million in gold. During World War II miners were directed to search for materials critical to the war effort. Oatman was a stop along historic Route 66. Tourists still travel to town to explore its history and to interact with wild burros that wander unsupervised everywhere in town.

Once again, you must find your way from the Enter/Exit square (at the top center) to the treasure and back to the starting location to win. The shaded areas are huge blocks. You can push a block if there is no wall and no block on the other side of it. The thick lines are walls. The dotted lines are arches. You can move through the arches but blocks cannot pass through arches. Neither you nor the blocks can move through walls or other blocks. When you move a block, it must move the entire length of a square.

Consider the partial grid below as an example. Block A and block C can't be pushed in any direction. Block B is free to be pushed in any direction except that we might not be able to get to the square west of Block B (to push it east). Block D can only be pushed north; the arch prevents us from pushing south, but we can move through the arch to push the block north. Once Block D is moved, Block C could be pushed east or west.

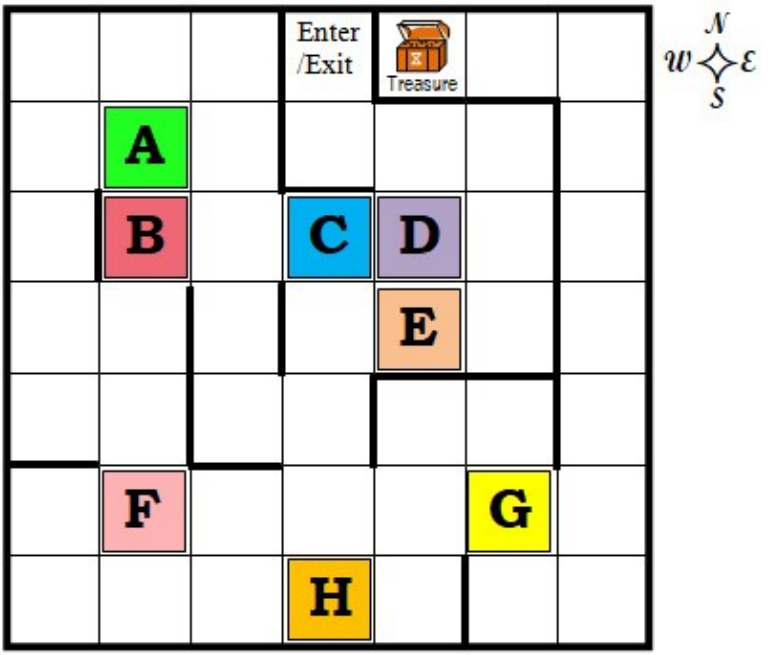


Try to solve these in your head. If you really get stuck, I'd suggest drawing the grid on a piece of graph paper with coins or other markers to represent the blocks. Of course, you can also peek at the Hints and Solutions.

82. Mined Blocks 1

Oatman AZ

Move from the Enter/Exit square to the Treasure square and return to the starting location. Don't go through any walls (the heavy black lines) or through any blocks (the shaded, lettered squares). But you can push a block into an empty square as long as there is no wall or block behind it.



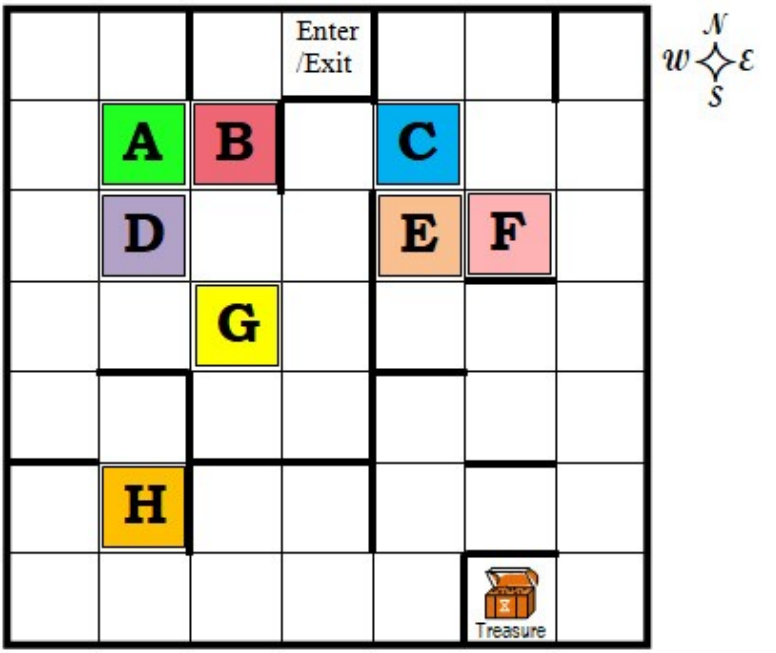
Hint: p. 136

Answer: p. 185

83. Mined Blocks 2

Oatman AZ

Move from the Enter/Exit square to the Treasure square and return to the starting location. Don't go through any walls (the heavy black lines) or through any blocks (the shaded, lettered squares). But you can push a block into an empty square as long as there is no wall or block behind it.



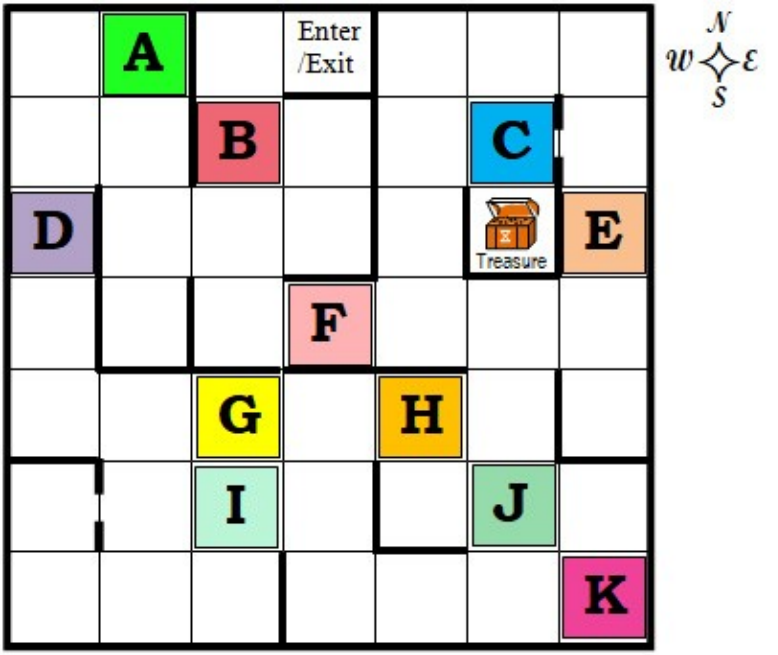
Hint: p. 136

Answer: p. 185

84. Mined Blocks 3

Oatman AZ

Move from the Enter/Exit square to the Treasure square and return to the starting location. Don't go through any walls (the heavy black lines) or through any blocks (the shaded, lettered squares). But you can push a block into an empty square as long as there is no wall or block behind it. The dotted lines are arches. You can move through the arches but blocks cannot pass through arches.



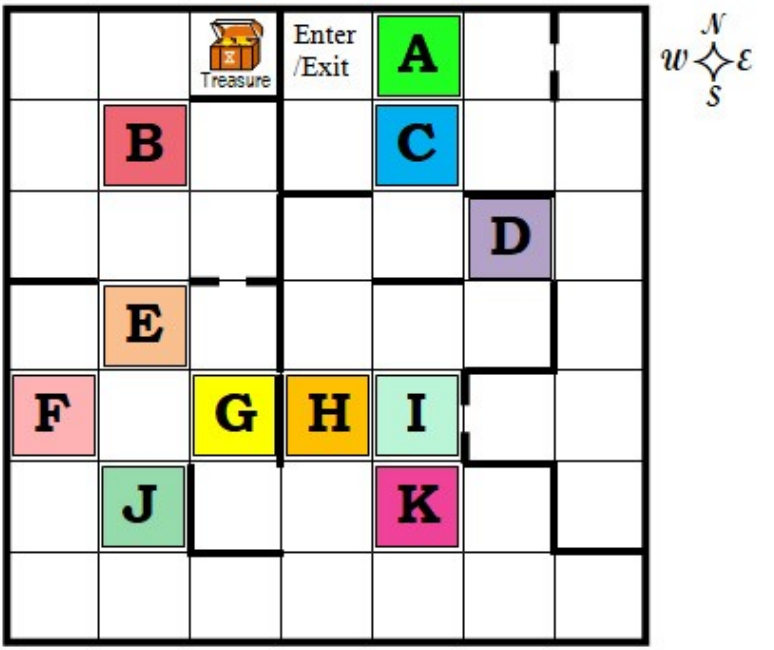
Hint: p. 136

Answer: p. 185

85. Mined Blocks 4

Oatman AZ

Move from the Enter/Exit square to the Treasure square and return to the starting location. Don't go through any walls (the heavy black lines) or through any blocks (the shaded, lettered squares). But you can push a block into an empty square as long as there is no wall or block behind it. The dotted lines are arches. You can move through the arches but blocks cannot pass through arches.



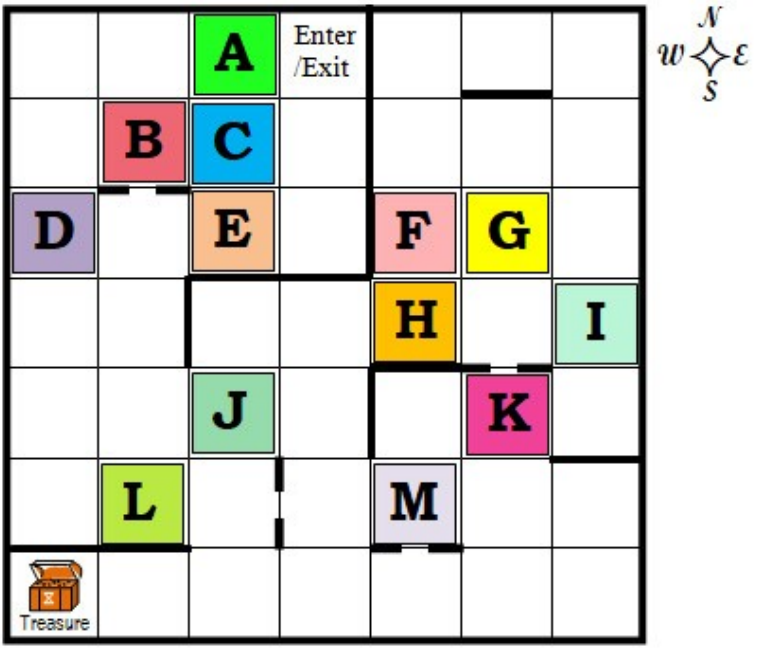
Hint: p. 136

Answer: p. 186

86. Mined Blocks 5

Oatman AZ

Move from the Enter/Exit square to the Treasure square and return to the starting location. Don't go through any walls (the heavy black lines) or through any blocks (the shaded, lettered squares). But you can push a block into an empty square as long as there is no wall or block behind it. The dotted lines are arches. You can move through the arches but blocks cannot pass through arches.



Hint: p. 137

Answer: p. 186

87. Perfect Square Combos

Twenty-Mule Team Borax

Twenty-mule teams (actually 18 mules and two horses) transported large wagons filled with borax from the mines in Death Valley to the nearest railroad spur. After the Harmony and Amargosa Borax Works shut down in 1888, the mule team's route was moved to the mines at Borate. Borax has been used as a laundry booster, as powdered hand soap, and as a tooth bleaching agent.

Place one number in each of the four blanks below such that the sum of any two of the numbers is a perfect square and the sum of all four numbers is also a perfect square. Henry Dudeney proposed this puzzle to his readers over a hundred years ago and presented the astounding answer of 386, 2114, 3970, and 10430. I am looking for a much simpler solution that you should be able to do in your head. None of the numbers should be zero.

___ ___ ___ ___

Hint: p. 137 Answer: p. 187

88. Who Am I?

Antelope Valley Hospital

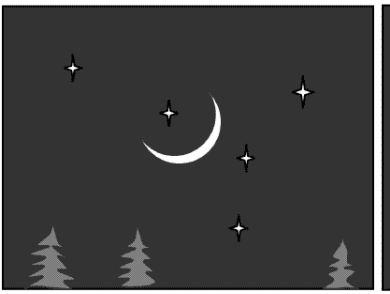
Unable to sit up, David is in the hospital. He had been through a traumatic experience. He doesn't know where he is. He doesn't know who he is. He doesn't even know his own name. The people gathered around him are his family, but he has never seen them before.

David is not injured, is not drugged, and doesn't have amnesia. He is a perfectly healthy human being, but he will never remember his life from before. He will accept his new situation and adjust to his new life. What has happened to David?

Hint: p. 137 Answer: p. 187

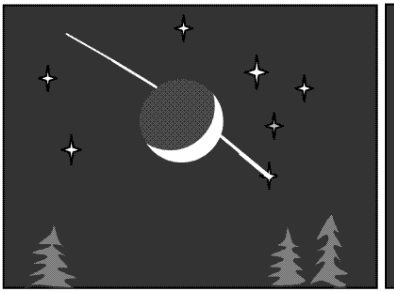
89. pHoneymoons Dark Night Sky, Mojave National Preserve

The Mojave Desert boasts some very dark night skies. Some spots are 50 - 100 miles from any city light pollution. It is a great place for astronomy. Consider these five situations and explain why each of the pictured situations could never really be seen in the night sky.



Crescent moon

Half Moon



Shooting star behind moon

The Big Dipper near the moon

Venus near the full moon

Hint: p. 137

Answer: p. 187

90. Gallery

Cedar Center for the Arts, Lancaster CA

Along Lancaster Boulevard ("The BLVD") you will find the historic Cedar Memorial Hall and the MOAH-CEDAR Art Gallery – proving that yogurt isn't the only culture in the Antelope Valley. Over the years this facility has hosted exhibits, plays, poetry readings, and musical events. This humble building inspired the following riddle:

I am a thing great artists draw
Without a pen or brush.
I am, at times, against the law -
Created in a rush.

'Though folks compose me, I may give
Artistic types a hand.
For only short times I can live
Where people sit or stand.

One person can assemble me
At parties - host, that is!
In solitude I cannot be
Created. That's my quiz.

Hint: p. 137

Answer: p. 188

91. Pay Me

Internal Revenue Service Office, Las Vegas NV

I thought about the IRS as I composed this riddle, but it really has nothing to do with that revered taxing authority.

I'm dangerous when you don't pay me,
And yet I never charge a cent.
Men stand up straight when people say me,
To mind and notice an event.
Synonymous with care and tending,
Consideration – that I am.
Just concentrate when time you're spending
And answer find to this exam.

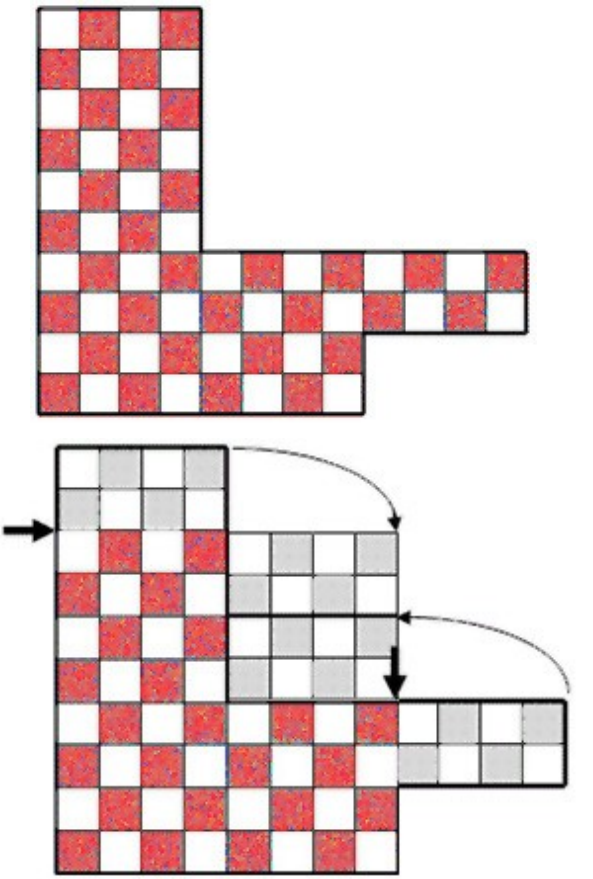
Hint: p. 138

Answer: p. 188

92. One-Cut Checkerboard

Split Rock, Joshua Tree NP

Two grizzled prospectors found this odd-shaped plank of wood with a checkered pattern on the top. They wanted to make it into an 8x8 checkerboard. Doug said he could cut off the top two rows of squares, cut off the eight squares sticking out to the right, and then stack the two resulting pieces to form the missing corner. (See the second diagram.) Digger, Doug's smarter partner, said he could make one straight-line cut and then arrange the resulting pieces into a square checkerboard. Doug reminded Digger that he couldn't fold the wood and that the pattern only appears on the top of the board.



Hint: p. 138

Answer: p. 188

93. What Goes Around

Lake Los Angeles CA

Lake Los Angeles is a small town that has no lake and is nothing like Los Angeles. Adrienne was working a crossword puzzle (there's not much else to do in Lake L. A.). She asks her husband, Dan, "What's a 6-letter word that fits this pattern: G, blank, O, blank, E, S." He replied, "There must be at least half a dozen words that fit."

"Okay, smarty pants," she challenged, "name five." And she went on to add a further complication to her challenge. Each word uses two letters to fill the blanks; he must use ten ***different*** letters to form the five words.

Using ten ***different*** letters, can you form five words by filling in the blanks below? For example, if you form 'GLOVES,' you can't use 'GROVES' for another word because the 'V' would be repeated.

G _ O _ E S

Hint: p. 138

Answer: p. 190

94. Short i, as in Fit

Planet Fitness

Research indicates that exercise and healthy eating can contribute to mental fitness as well as physical fitness. Gym memberships, especially for busy women, have been increasing. Private trainers have been pretty popular, too. In desert heat, be sure to exercise in air-conditioned areas, stay hydrated, and start with short sets.

There are six letters that can be vowels in English: a, e, i, o, u, and y. The word 'fit' uses the letter i to form the short i sound. Your challenge is to come up with words where the other five vowels are used to form the short i sound.

Hint: p. 138

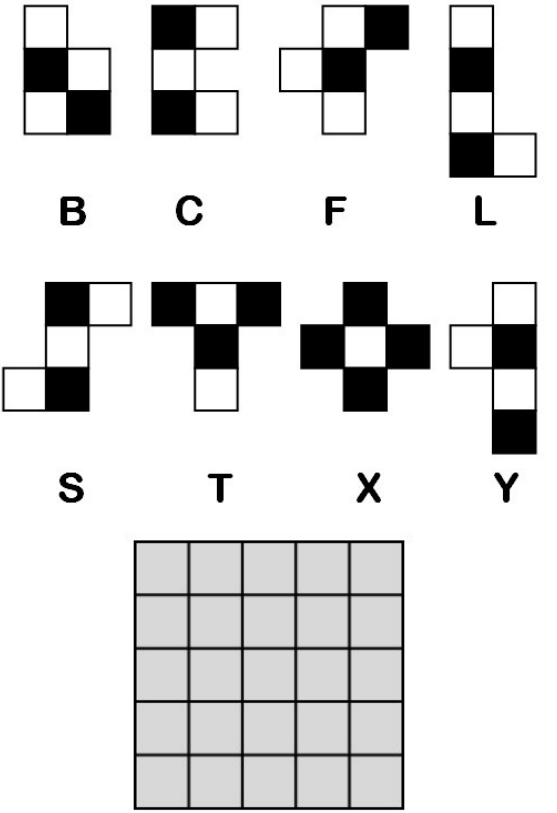
Answer: p. 190

95. Pentomino Checkerboard

High Winds

Parts of the Mojave Desert are known for high winds. Powerful gusts can kick up dust storms, scrub a planned hot air balloon trip, or ruin an outdoor wedding. At the Pahrump Valley Speedway a strong wind could do more than stir up the dirt of the stock car racetrack; it could rip their checkered flag to pieces.

Create a 5x5 checkerboard pattern using 5 of the 8 pieces below. You must decide which 5 pieces to choose. You may not use the same piece multiple times. The letters are just names we'll use to refer to the pieces in the hint and answer.



Hint: p. 139

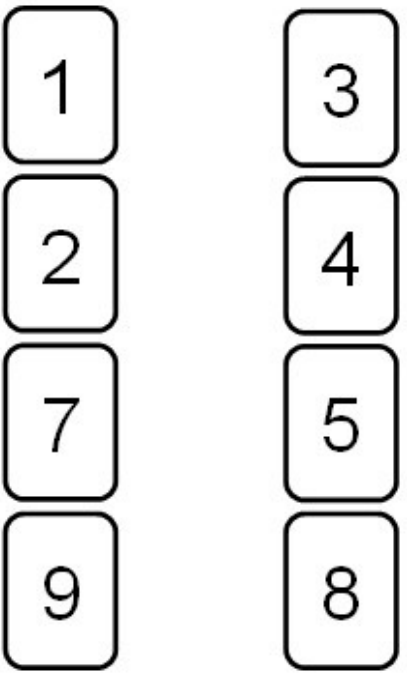
Answer: p. 190

96. Some Totals

The library in my Palmdale home

Henry Dudeney was a puzzle superstar of the late19th and early 20th Century. I stumbled across this puzzle of his and enjoyed solving it. I came up with the answer that he had intended, but it occurred to me that I could also solve the problem in a way that uses even fewer moves. See if you can at least find Dudeney's solution.

Eight numbered cards are arranged in two columns. The object of the puzzle is to rearrange the cards so that the numbers appearing in each of the two columns add up to the same total. And do it in the fewest moves possible.



Hint: p. 140

Answer: p. 191

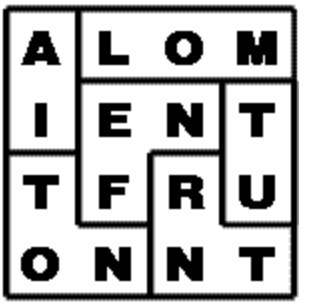
Jigsaw Messages

The Musical Road, Lancaster CA

As part of a TV ad campaign, Honda had grooves cut into a section of road in Lancaster, California. If you drive at 50 mph, your tires vibrate in a way that sounds like The William Tell Overture. You might call it "music in the key of Avenue G."

The musical road demonstrates that messages can be transmitted in many different ways. Imagine that your colleague left you three messages. Each is an instruction consisting of four four-letter words. Each message comes in a group of six or seven jigsaw-like pieces that must be reassembled to form the original message. Your job is to rearrange the pieces and determine the message.

97. Jigsaw Message 1



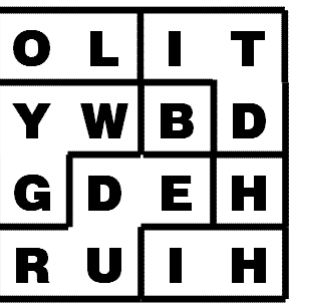
Hint: This is not as straightforward as you might think. Maybe you should turn down the job.

Hint: p. 140 Answer: p. 191

98. Jigsaw Message 2

Hint: This puzzle has a couple of diabolical twists to upset you.

Hint: p. 140 Answer: p. 192



99. Jigsaw Message 3

Hint: There's another trick here. You could be in good shape if you think outside the box.

Hint: p. 140 Answer: p. 192

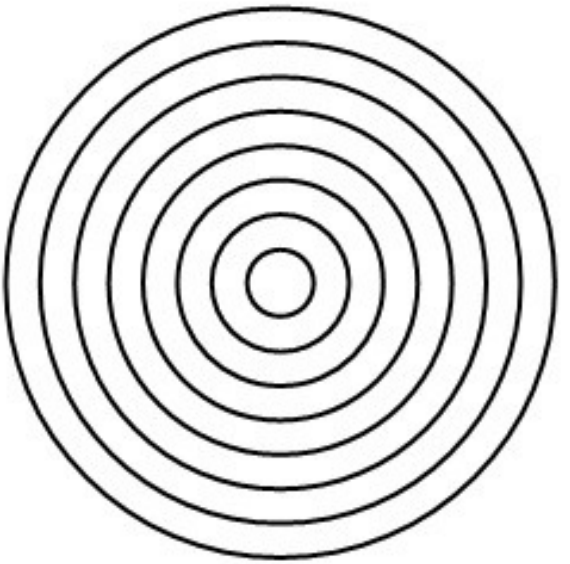
100. Equal Areas

Devils Hole, Ash Meadows NV

Ash Meadows, a detached unit of Death Valley National Park, is an area of spring-fed oases. Devils Hole is an opening into a vast aquifer under Ash Meadows; its pond is the home of endangered Devils Hole Pupfish.

Large earthquakes, even half a world away, cause water to slosh up and down in the hole. A 7.1 earthquake in July 2019 repeatedly raised the water level up and down as much as 15 feet. Perhaps the water left concentric circles on the walls of the funnel canyon.

Eight concentric circles have radii of 1, 2, 3, 4, 5, 6, 7, and 8. There are two kinds of regions (circle and annulus) in this diagram. An annulus is a ring (like a zone on an archery target). Adjacent annuli (plural of annulus) can be grouped to define a fatter ring. Therefore, there are a total of 36 different regions (8 circles and 28 annuli). Find two regions in this diagram that have the same area. Then find four more pairs of regions with equal areas.



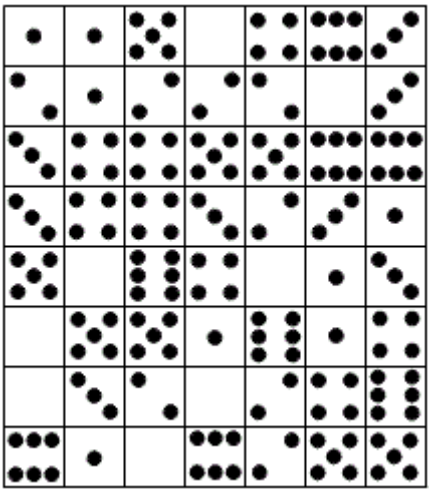
Hint: p. 140

Answer: p. 193

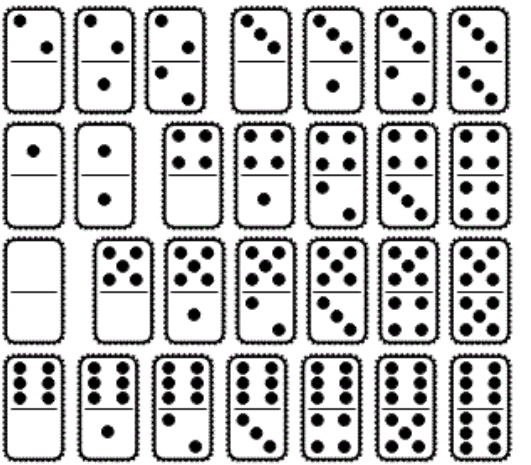
101. Domino Mosaic

Mosaic Canyon, Death Valley NP

Death Valley's Mosaic Canyon contains breccia, a conglomerate rock composed of tiny angular fragments of various types of parent rock locked within a natural cement. This puzzle asks you to arrange 28 dominoes (shown in the "boneyard" at the bottom of the page) to form the mosaic pattern pictured here.



"Boneyard" – The dominoes (number pairs you can use)



Hint: p. 141

Answer: p. 195

102. Domino Jigsaw 1

Bird Fossils, Lake Manix

Bird fossils have been found at prehistoric Lake Manix at the south end of Death Valley. Paleontologists carefully excavate the fossils and cap them with plaster. They record the fossil's exact location and condition. The item is removed, jacketed, and sent to the lab. The animal is then reconstructed, either physically or virtually.

Arrange 28 dominoes (shown in the "boneyard" at the bottom of the page) to form the pattern pictured here.

0	4	4	2	1	6	4
3	2	1	0	5	5	0
2	6	5	0	3	6	2
5	4	1	5	1	1	2
3	0	0	6	5	6	4
1	2	0	6	0	6	3
6	4	2	3	1	3	3
4	5	3	2	1	4	5

Of course, a domino can't go diagonally, but a number pair like 1-3 could be used in any of four orientations:

$$1-3 \qquad 3-1 \qquad \frac{1}{3} \qquad \frac{3}{1}$$

"Boneyard" – The dominoes (number pairs you can use)

0-0						
0-1	1-1					
0-2	1-2	2-2				
0-3	1-3	2-3	3-3			
0-4	1-4	2-4	3-4	4-4		
0-5	1-5	2-5	3-5	4-5	5-5	
0-6	1-6	2-6	3-6	4-6	5-6	6-6

Hint: p. 141

Answer: p. 196

103. Domino Jigsaw 2

Bird Fossils, Lake Manix

Like the previous puzzle, arrange 28 dominoes to form the pattern pictured here.

4	2	6	3	5	1	0
6	1	5	0	0	1	3
6	4	0	1	4	5	6
0	2	5	5	3	2	1
2	0	4	3	1	3	4
2	4	2	6	3	2	4
4	5	3	5	3	0	1
1	6	6	0	5	6	2

Hint: p. 141

Answer: p. 197

104. Domino Jigsaw 3

Bird Fossils, Lake Manix

Like the previous puzzle, arrange 28 dominoes to form the pattern pictured here.

2	3	0	5	4	1	3
2	1	1	5	6	4	0
6	3	3	1	2	6	3
6	0	4	3	1	2	2
1	0	4	0	4	5	6
2	6	4	2	0	5	6
0	1	5	4	0	6	3
5	5	2	1	3	5	4

Hint: p. 141

Answer: p. 199

Part 5: Test Flights

Back in 1947 when Chuck Yeager first broke the sound barrier, being a test pilot was an extremely risky business. It is still hazardous, but several conditions have changed for the better. Aircraft designers have decades of flight history to rely on. Computer simulations aid both designers and pilots. And wartime pressure no longer drives frenzied development efforts.

The empty Mojave Desert has been an ideal place for testing experimental aircraft. Sparsely populated areas reduce the danger to civilians and their complaints about sonic booms. Many residents actually love getting previews of cutting-edge aircraft. Test flights began from Muroc Army Air Field (later renamed Edwards Air Force Base) before the Cold War. Both military and private aircraft (including spacecraft) are still tested there.

Being a test pilot may have gotten safer and easier, but the puzzles here have become more difficult. The remaining brainteasers in this book are tough. Looking at the hints is a sign of wisdom, not shame.

105. UFOs

Groom Lake, Area 51 NV

Unidentified Aerial Phenomena (the latest term for UFOs) are often reported in the skies around Groom Lake, Nevada. After all, the government has admitted that "Area 51" has long been used for testing top secret aircraft. Conspiracy theorists have further speculated that extraterrestrial technology is involved.

Your challenge in this series of puzzles is to help me explain each Unidentified Aerial Phenomenon (UAP) sighting that I have personally experienced. (Of course, then they will be Identified Aerial Phenomena.) After I got over the creepy feelings each situation triggered, I explained each sighting without resorting to aliens, military secrets, or hobbyists' drones.

1. We were camping on level ground. The night was dark, but a Coleman lantern lit up our group enough to take videos without any flash or floodlight needed. Of course the lantern pretty much ruined our night vision, so the stars were hard to see despite the clear sky. When we reviewed one video we took, we had evidence of a UAP.

A white light (bright enough for the camera to record) circled in a tight, random pattern for about ten seconds. Then it streaked across the sky (the entire camera frame) and vanished. I've never seen any aircraft travel that fast.

2. I was driving east in the Antelope Valley a couple of miles north of the San Gabriel Mountains. The sun had just set, but gray twilight still filled the sky. When I saw the UAP, I had to pull over and look closely from outside my car. A huge saucer-shaped disk hovered over Devil's Punch Bowl (a rock formation about 10-15 miles to the east). It looked like something out of the movie Independence Day. It had no lights of its own; just the dim twilight defined the object.

3. It was about five days after Christmas in 1972, too late for any Santa Claus sighting. I was standing outside my parents' house in Pasadena, California, when I heard a hushed rumble from above. I looked directly overhead into the clear, night sky and saw an oval ring of lights turning clockwise as it moved slowly to the northeast. The UAP was too quiet, too slow, and too low to be an airplane; this was like no airplane I'd ever seen. I had at least a minute to watch it

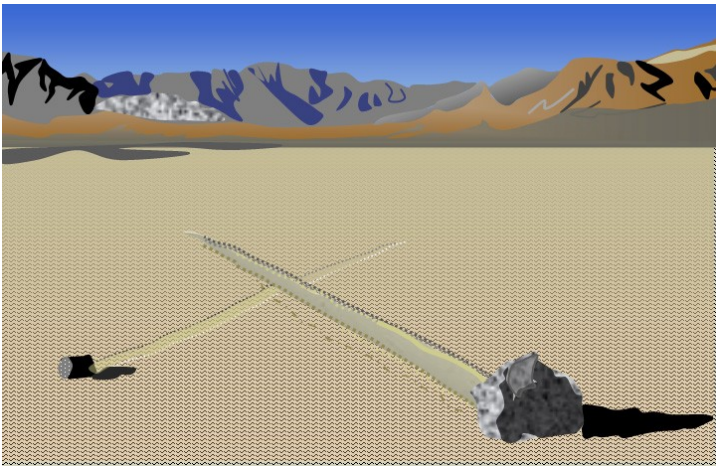
until it flew out of sight beyond the house. As eerie as that sight was, I figured out what I was seeing as it flew away.

4. An hour after sunset on a clear moonless night I was stargazing from my Palmdale home. A bright point of light hung above the eastern horizon. It was not a planet because it slowly rose relative to the background stars. Gradually it split into two lights, one over the other. I grabbed a cell phone and set it to record video. The objects were just bright enough to see on the video. I zoomed in and was surprised to see that each object was a sphere with a bright circular center and a hazy outer surface. I heard no sound as the objects rose higher in the sky. Eventually I saw more lights travelling with the UAPs and was able to identify what they were.

5. It was a clear, moonless night about two hours after sunset. A moving point of white light slowly traveled from south to north. It took a few minutes to silently cover about two thirds of the sky overhead and into the northern constellations. Then it just winked out and vanished. It was not a plane; there were no wing lights. There were no flashing lights, just a steady white point of light until it disappeared among the background of stars.

Hint: p. 142 Answer: p. 201

106. The Sailing Stones Racetrack Playa, Death Valley NP

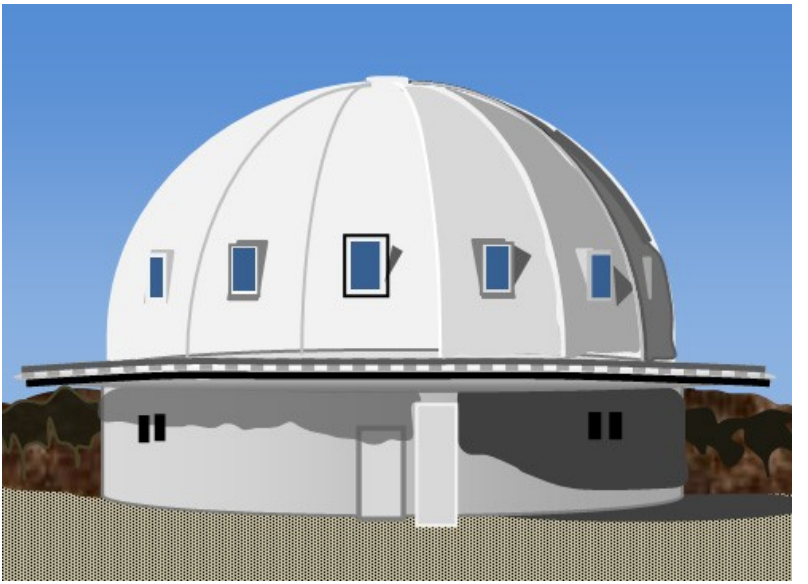


The sailing stones of Death Valley's Racetrack Playa leave trails on the dry lake as if someone or something had scraped the heavy rocks across the level clay surface. There was never any evidence of a hoax. Large rocks left straight gouges; lighter rocks tended to meander about. Some people speculated that gale force winds may have pushed the stones across the slippery mud after a rare rainstorm. Others thought that the tracks behind the rocks didn't really mean that the stones had moved. After all, no one had ever witnessed the rocks moving ...until 2013.

Researchers noted that the tracks were created only in the winter. They set up cameras and GPS trackers in an attempt to record any movement. Then they waited. In December of 2013, rain formed a shallow pond at the south end of the playa. The pond froze overnight but thawed the next day. A gentle breeze gusted most of the day. Scientists documented movement of 60 stones and solved the mystery of how heavy rocks could slide along the lake bed.

Your puzzle is to see if you can guess what the researchers saw when they reviewed the video and GPS results. For decades everyone was baffled by these tracks. So I realize that it is grossly unfair to ask you this, but it is such a fascinating mystery. Just give it some thought before you peek at the answer.

Hint: p. 142 Answer: p. 202



In 1953, George Van Tassel was meditating under Giant Rock when he was contacted (first telepathically, then in person) by extraterrestrials. The aliens shared the secret of rejuvenating human cell tissue. Van Tassel used the alien design to construct the Integratron; he claimed that the structure was capable of rejuvenation, anti-gravity, and time travel. The building looks like a volleyball the size of an observatory.

Even if you have not experienced the recharging energy of the Integratron, see if you can solve these challenging cryptic crossword puzzles.

Cryptic crossword clues aren't quite like the clues in a typical crossword puzzle. These clues point to the answer in two ways: with a definition and with wordplay. The **definition** is basically a standard crossword clue. The **wordplay** defines the answer in one of several ways (an anagram, a homophone, etc.). Watch for **indicator** words that tell you what kind of wordplay is used or how multiple syllables are arranged. The number in parentheses at the end of the clue represents the number of letters in the answer.

Here is a quick summary of the types of wordplay used in cryptic crossword puzzles.

Type of Wordplay	Sample Indicators	Example
Anagram: rearrange the letters	Alter, at sea, change, crazy, engineer, fool with, novel, wild...	Bemoan mental disorder (6) = Lament (anagram MENTAL)
Homophone: sound-alikes	Heard, mention, utter, reported, they say, we hear...	In recital, Bach says, "Loges" (5) = Boxes (Bach says)
Two Meanings: two clues	None	Average psychic (6) = Medium
Charade: build a word from two or more pieces	Positional words if not already in order (after, before, trails...)	Fast hip-hop identification (5) = Rapid (RAP+ID)
Reversal: read backwards	Back, counter, flip, in return, turned...	Friends hit back (4) = Pals (SLAP reversal)
Hidden: concealed inside a word or phrase	Abridged, from, guards, housing, in, part of, some...	UFOs silently abducted old fogey (6) = Fossil (in "uFOS SILently")
Container: a word put inside another word	Adopts, boards, gets, inside, keeps, takes...	A dollar bill is among my cash (5) = Money (ONE in MY)
Deletion: drop a letter or two to form a new word	Almost, behead, crop, discovered, endless, trim...	Hold endless protest (4) = Grip (GRIPE – E)
& Literal: entire clue is both the definition and the wordplay	"!" at end of clue	Works with horse! (5) = Shoer (anagram of HORSE is someone who works with horse)

Type of Wordplay	Sample Indicators	Example
Lettering: one letter from each word in a series	Initials, starts to...	Starts to swell up, developing soap foam (4) = Suds (S-U-D-S)
Composite: combine multiple styles in one clue	Various (about = container; returning = reversal)	It's about me returning things (5) = Items (ME reversal in ITS)

Here are a few examples to try before you attempt the puzzles:

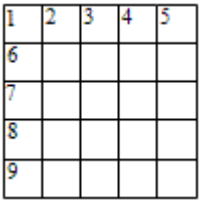
1. Ridiculously dusty den (5)
2. Line prompt in audition (5)
3. News media push (5)
4. Something sentimental to Barbie's beau (5)
5. Retro cable-stitch clothes smell bad (5)
6. Some microbes eat fat (5)
7. Everyone got to tropical island (5)
8. Give speech to directorate after the 6th (5)
9. Stud was pulverized! (7)

And the answers...

1. Anagram of 'dusty' = den (STUDY)
2. Homophone of 'prompt' (CUE) = line (QUEUE)
3. Two definitions: News media & push (PRESS)
4. Charade: TO + KEN = something sentimental
5. Reversal of KNITS = smell bad (STINK)
6. Hidden in 'microbes eat' = fat (OBESE)
7. Everyone (ALL) contains TO = small island (ATOLL)
8. 'Directorate' after the 6th letter = ORATE
9. Anagram of 'stud was' = pulverized stud (SAWDUST)

107. Cryptic Crossword 1

The Integratron, Landers CA



Across
1. Answer concerning layer of wood (5)
6. Pig looked inside Eskimo dwelling (5)
7. Initially false ruse and unlawful deception! (5)
8. Wound up backtracking in ones network (5)
9. Iron alloy bargain, so to speak (5)

Down
1. First shaking created rock fissures (5)
2. Heron regrets losing extremities (5)
3. Reportedly ordinary aircraft (5)
4. Fail to keep boxing up bloodsucking insect (5)
5. New arrangement of ye old Alpine song (5)

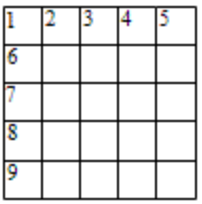
Hint: p. 143

Answer: p. 203

108. Cryptic Crosswords 2

The Integratron, Landers CA

Across
1. Almost spotted Granny Smith (5)
6. King gets Los Angeles rest (5)
7. Give a speech or eat bananas (5)
8. Prospector split beam in error (5)
9. Somewhat paler than warning signal (5)



Down
1. Smell to Rome in Italy (5)
2. Risk redesigning Pier 50 (5)
3. Shave wood flat (5)
4. I will leave retail counter in a while (5)
5. Wield last of ax in climbing tree (5)

Hint: p. 143

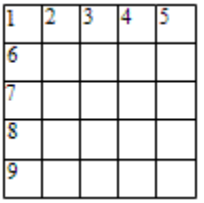
Answer: p. 204

109. Cryptic Crossword 3

The Integratron, Landers CA

Across

1. Penny talked about perfume (5)
6. Birch bark walking stick carried out (5)
7. Frontiersman Kit discovered pyromania (5)
8. Provoke exchange of Euros (5)
9. Stifle ethnic housing fast (5)



Down

1. Mark left loud muffler (5)
2. Burnett to sing Xmas songs (5)
3. Follow printer's measure process (5)
4. Loop soon turned east (5)
5. Doctrine unchanged in review (5)

Hint: p. 143

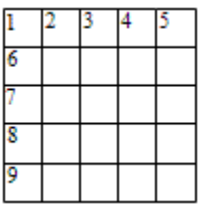
Answer: p. 205

110. Cryptic Crossword 4

The Integratron, Landers CA

Across

1. Jean dug up minerals in recession (5)
6. Wipe out monkey with a seer (5)
7. Run out of grills; cooks in water (5)
8. Runs out of gear listening to false gods (5)
9. Cranky beginnings of the edgy, sullen treatment? Yes. (5)



Down

1. An accounting entry put me in debt (5)
2. English earl has rod wear down (5)
3. Brad's aces (5)
4. Little atoll is rented (5)
5. Disorganized some domes' symmetry (5)

Hint: p. 143

Answer: p. 206

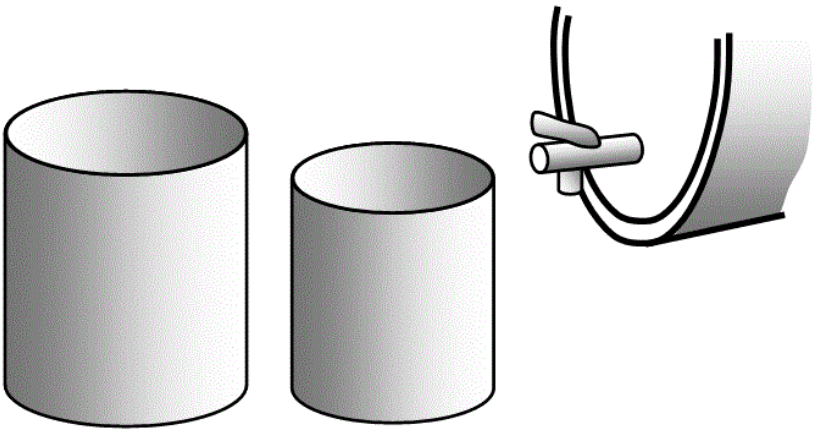
111. Four Gallons Out Antelope Valley Winery, Lancaster CA

There are very few wineries in the Mojave Desert. One is the Antelope Valley Winery. In addition to wine tasting, they offer a seasonal farmers market. Here is the puzzle they inspired:

You have two perfectly cylindrical containers (empty). One has a 5-gallon capacity (to the brim). The other has a 3-gallon capacity. A huge cask of wine with a spigot is nearby. None of the containers have any markings on them, and you don't have anything to mark them with. The spigot doesn't have any measurement device (flow regulator) to know how much is coming out.

Here are two challenges:

1. Measure exactly 4 gallons into your containers. You may pour wine back into the cask if you need to.
2. Starting with empty containers, measure exactly 4 gallons into your containers. But this time you may not pour any wine back into the cask (or down the drain, etc.). In fact, you may not pour more than 4 gallons into your containers.

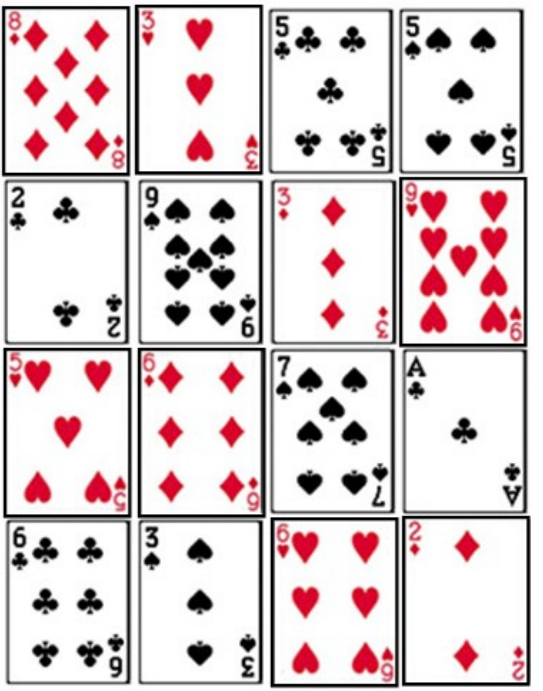


Hint: p. 143 Answer: p. 207

112. Put Your Cards on the Table

Stratosphere Casino

Betty won just enough money arm wrestling with the one-armed bandits to afford a souvenir pack of playing cards at the gift shop. Using a standard pack of 52 playing cards, she placed 16 cards on the table in the following array:



She challenged her dice-playing friend, Rollie, to overlay four of the cards in the array with cards remaining in the pack such that each row and each column adds up to the same number and shows exactly one card from each of the four suits. Aces have a numeric value of 1. Face cards have a numeric value of zero. There are no jokers or wild cards.

8D	3H	5C	5S = 21
2C	9S	3D	9H = 23
5H	6D	7S	1C = 19
6C	3S	6H	2D = 17
=	=	=	=
21	21	21	17

Hint: p. 144

Answer: p. 208

113. How Like a Dove

Bird Watching

Despite the arid landscape, the Mojave Desert shelters many native and migratory birds including: quail, owls, roadrunners, ravens, hawks, black phoebes, golden eagles, and (yes) vultures. Here is a charade that seems to have something to do with birds.

How like a dove – when I'm complete
I fly above my first who'll eat
A bit of anything it can
To grow and then be fare for Man.
My second ran a length of time,
Far longer than this silly rhyme.
By linking animal and age,
My whole you can release or cage.

Hint: p. 144

Answer: p. 210

114. Play With Me

Bad Guys

In May of 1875 banditos raided a station along the Cottonwood Stagecoach Line about 5 miles north of Helendale. The robbers were led by Cleovaro Chavez. Their former leader had been the notoriously dramatic highwayman Tiburcio Vasquez, but he had been hanged for murder two months before.

To most, my left will be their right.
I'm down and up, not front and back.
At times, I'm dark with lots of light.
And on my rails, no train on track.

My legs are never used to walk.
My wings do not allow me flight.
You come to hear, but I don't talk.
I lure but often cause folks fright.

My hands are those you rarely see.
But when my story is unfurled,
You'll gladly pay the entrance fee,
For people say I'm all the world.

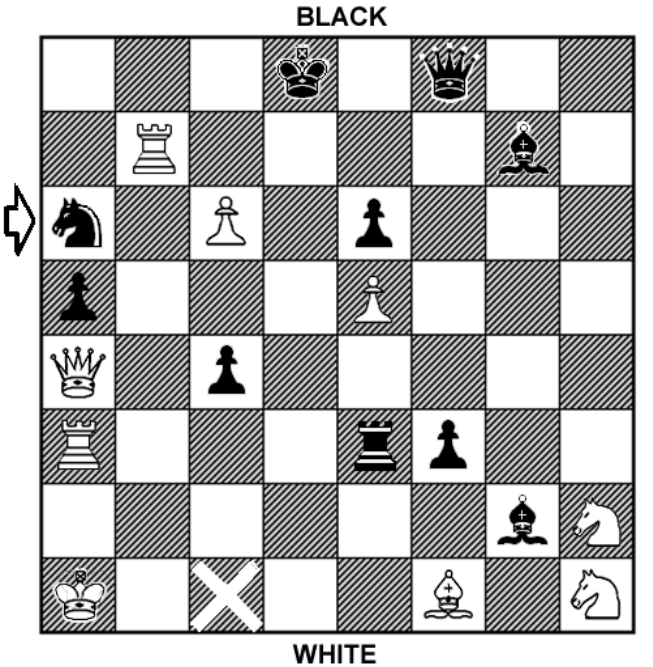
Hint: p. 144

Answer: p. 210

115. One Black Knight Furnace Creek Ranch, Death Valley

When the heat kept May and Sonny Day indoors playing chess, May devised this puzzle to occupy her husband until the cool of evening.

This puzzle is worked on a chessboard. If you don't know how to play chess, you'll have to skip it. Begin with the board arranged as shown and move the black knight, according to normal knight movement, from its starting point at QR3 to the square marked by an "X" (QB8). Only the black knight can be moved; all other black and white pieces remain as shown unless captured and removed from the board by the knight. Follow the normal rules of chess with one added stipulation: the black knight must never put itself in a position such that White could legally capture it if White were allowed to make its next move as usual. For example, the knight cannot make its first move to QB2 (to the right of the rook) because the rook could attack that square if the rules of this puzzle did not prevent White's movement.

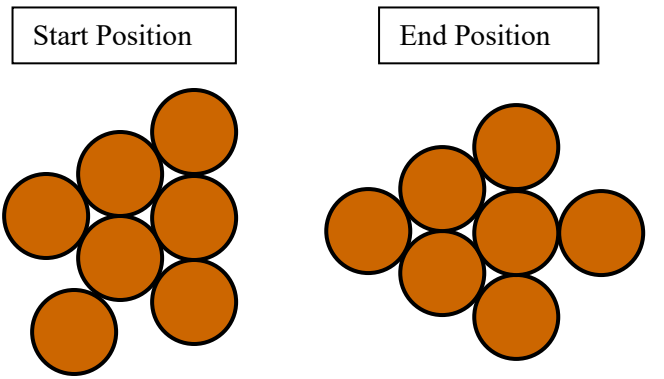


Hint: p. 144 Answer: p. 210

116. Coin Arrowhead Antelope Valley Indian Museum SHP

The Antelope Valley Indian Museum houses more than 7,500 Native American artifacts and artworks. Evidence of hunting weapons goes back at least 10,000 years. Stone points were crafted for spears and short projectiles used with an atlatl (a rod that extended a thrower's leverage and power). Bow and arrow technology was adopted by the Indians in the Mojave Desert around 1,500 years ago.

Seven coins are arranged in the shape of an arrowhead pointing up to the right. Your puzzle is to get the same shaped arrowhead pointing to the left by moving the fewest number of coins.



However, there are restrictions on how you can move a coin. A move consists of sliding exactly one coin along the table until it comes to rest touching two other coins. Therefore, you can't just move the 'tail' of the arrowhead from the lower left to the far right. One coin cannot be used to push another coin.

At last you have a good use for that huge jar of pennies.

Hint: p. 145 Answer: p. 212

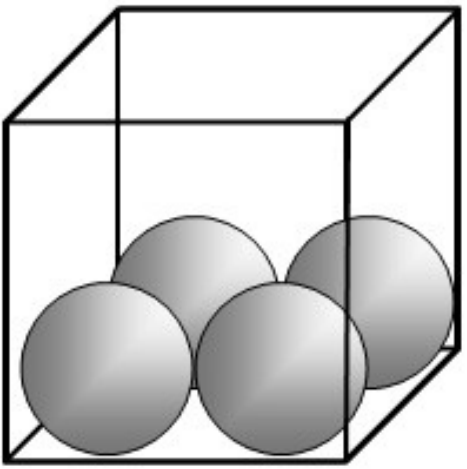
117. Covered Spheres

Fossil Falls, Coso Range CA

Fossil Falls stands as a dry remnant of an ancient waterfall in the Coso Range west of Death Valley. As ice age glaciers melted, torrents of water sculpted lava rocks into smooth shapes resembling glossy black globs of soft serve ice cream. Swirling meltwater also drilled some deep potholes as it poured over the rocks.

Warning: Mercury is a hazardous material. Please wear hazmat gear while doing this thought experiment.

Imagine you have a cube-shaped glass container with inside dimensions of 2" x 2" x 2". Four steel balls fit easily into a square pattern at the bottom of the container because each ball has a diameter of just slightly less than 1". If you were to pour liquid mercury into the container, what volume of mercury would you need to use to be sure that all four balls would be completely submerged in the mercury?



Hint: p. 145

Answer: p. 213

118. Dicey Situation

Paradise NV

The greater Las Vegas area includes the suburbs of Henderson, Paradise, and North Las Vegas. (I'm not sure where the lesser Las Vegas area is.) I once met a resident who made this statement about his fair city: "It's a great place to live, but I wouldn't want to visit it."

He said that the town was populated with good people. Visitors tended to be gamblers, but the locals had to be immune to Sin City's temptations. In the long run gamblers went broke. The odds always favor the house.

Here is a game of chance with some highly unusual dice. How can you get the odds to favor you?

Imagine a game that uses the three dice shown below. The numbers on the three visible faces are repeated on the three hidden faces, as well. So die A has (1, 1, 5, 5, 9, 9), die B has (2, 2, 6, 6, 7, 7), and die C has (3, 3, 4, 4, 8, 8). The first player chooses one of these dice; then the second player chooses one of the remaining dice. The two players roll their dice, and the higher number scores 1 point. The winner of the game is the player with the most points after 100 rounds of play. Do you want to be the first player or the second player? Which die would you choose?

A. **B.** **C.**

Hint: p. 145

Answer: p. 213

119. 4×4 Grouping

Mojave National Preserve

A rugged 4×4 vehicle is recommended when you drive the Kessler Peak Trail. Starting at the Mojave Cross memorial on Sunrise Rock, the dirt road seems tame enough. But creek crossings and washouts often require four-wheel drive. Luckily, none of this is relevant to the following puzzle.

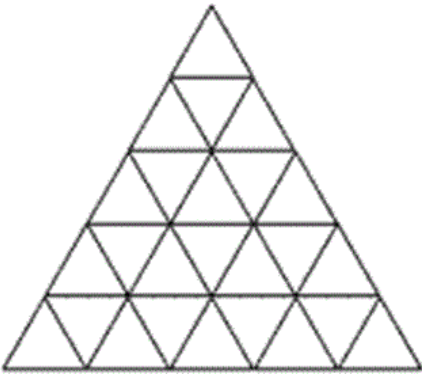
Categorize each of the sixteen pictures into one of four groups. Each group will consist of exactly four pictures with something in common. Each picture will be in exactly one group.

Hint: p. 146

Answer: p. 213

120. Laser & Mirrors Security at the Luxor Hotel, Las Vegas

The impressive Luxor Hotel is shaped like a pyramid. Some say a pyramid shape can improve health and keep razor blades sharp.

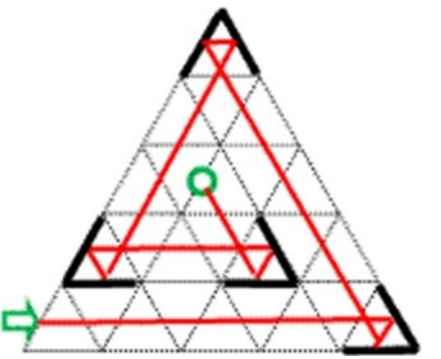


A triangular area is divided into 25 areas, each an equilateral triangle the same size and shape as the others. You need to set up a security system with one beam of laser light that shines through every area. Set up a projector, a receiver, and several mirrors to accomplish each of the five challenges set out below.

Mirrors: The mirrors are small, just big enough to reflect the beam. However, our diagrams show the mirrors being as long as one side of a small triangular area. This was done to help you understand how the mirrors are set. Consider the mirrors to be reflective on both sides if that helps your solution.

Beam: The beam is allowed to cross itself and to cross the same area more than once. To get credit for covering one of the triangular areas you must have the beam pass straight through the area from the middle of one side to the middle of another side. This means that the beam will travel through the area in a direction parallel to one of the three sides of the large triangle.

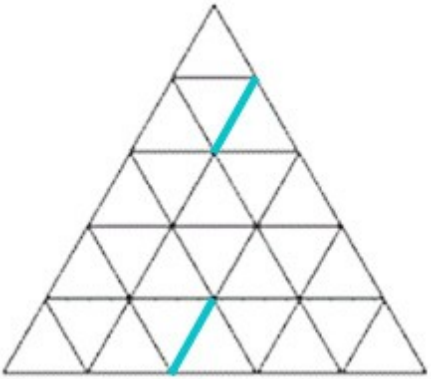
Consider this example to help understand how the system can be set up. The arrow represents the projector. The circle represents the receiver. The heavy black lines are mirrors. The beam passes through the middle of each area. Eight mirrors are used.



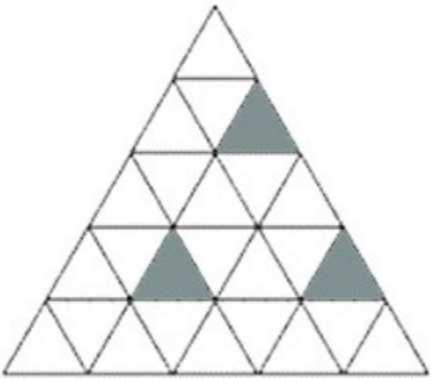
Challenge 1: Cover all 25 areas using only seven mirrors.

Challenge 2: Cover all 25 areas such that the beam enters each area only once and never crosses itself.

Challenge 3: With two mirrors already placed as shown in the diagram, cover all 25 areas by adding only six mirrors.



Challenge 4: The shaded areas in the diagram represent solid columns that the beam can't pass through or bounce off of. Use only six mirrors to cover all 22 remaining areas.



Challenge 5: Accomplish Challenge 4 without having the beam travel outside of the large triangular area.

Hint: p. 146 Answer: p. 214

Hints

1. Tumbleweed Puzzle: p. 3 Answer: p. 147

See if you can form a four-letter word starting at the "O". The only ones I can see are ORAL and OVER. Can you form any three-letter words going on from either of these words? Remember that you can use a heavy connecting line only once.

2. Find the Twins Puzzle: p. 4 Answer: p. 147

The differences are not in the head or feet of the figures; don't bother looking there. The differences are very subtle. You will have to look carefully. If you need more help, consider these time references: 5:30, 6:00, 9:30, 11:30.

3. Rabbit or Jackalope? Puzzle: p. 5 Answer: p. 148

Do you really need a hint? Okay, try alternating high and low.

4. Nine Lives Puzzle: p. 6 Answer: p. 148

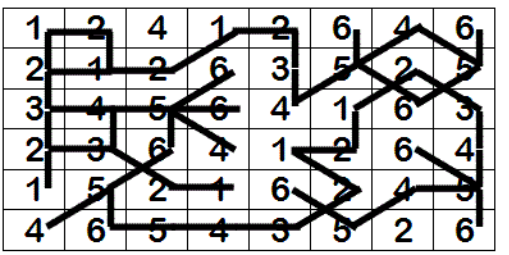
The kitten's nine lives are represented by the digits 1 through 9. Find the digits hidden in the drawing. They are all right-side-up in black Comic Sans type face.

5. Constellation Connecting Puzzle: p. 7 Answer: p. 148

I think the quickest way to get an idea for the hidden object is to check out the perimeter areas (numbers 1-15 and numbers 40-55). Notice, too, that the 60s and 70s form straight lines that crisscross each other.

6. One Difference Maze Puzzle: p. 8 Answer: p. 149

With a conceptual maze like this, I like to draw the connections that the rules allow. Then I can see what paths are allowed. Be aware that paths can cross each other without allowing access to the other path (like an overpass, instead of a crossroads).



7. Alphabetical Order Puzzle: p. 9 Answer: p. 149
Of course, "ghost" and "chintz" keep the words from being listed in alphabetical order. They are not even in reverse alphabetical order. And yet, in some way they are in alphabetical order.

8. Irregular Verbs Puzzle: p. 9 Answer: p. 150
If you choose to meet the challenge without resorting to Google, I suggest you keep a pencil and a bit of paper handy for a few days to jot down answers as they come to light. This may lead to a few answers where a silent "e" is dropped to form the past tense. But if you are really fed up, go to the solutions section.

9. Blythe Geoglyphs Puzzle: p. 10 Answer: p. 150
Geoglyphs are amazing because they are drawn to be seen from above. The message in this puzzle was intended to be read from the highway at ground level, but it was drawn on a horizontal surface.

10. Sign Language Puzzle: p. 11 Answer: p. 150
Pick one sign and assume for the moment that it is correct. Then determine the truth or falsehood of the other signs based on that assumption. If a contradiction occurs, the chosen sign must be false. Then determine the truth or falsehood of the other signs based on that new assumption.

11. Kids and Pets Puzzle: p. 11 Answer: p. 151
Assume that Chuck and Wallace are boys and Mary is a girl. Who owns the dog? Who is ten years old?

12. Give Me a Break Puzzle: p. 12 Answer: p. 151
One way to look at the poppy reserve is "Pop pyre serve."

13. Paint by Numbers Puzzle: p. 13 Answer: p. 151
Look for the boundary line between the segments with two dots and those with only one. In this way we can define the outer edge of the pictured thing. Of course, you need to ignore the jet airplane shape that seems to jump out at us.

14. Sprocket Science

Puzzle: p. 14 Answer: p. 151

Gears that mesh with each other always turn in opposite directions. To determine how the cable (fan belt) transmits motion between gears, imagine a spot along the cable and follow it from one gear to the other.

15. Mixed Doubles

Puzzle: p. 14 Answer: p. 152

Only a few of these sports are offered at UNLV, but most are featured in the Olympics. One is the national sport of Canada.

Beware of some unusual pronunciations for words like bass, chi, and sake. Look for words that are likely to appear second in the name of a sport (for example, bawl, cling, sing, and yakking). As you find a few pairs, there are fewer words to choose from. Try combinations and listen for familiar names.

16. Rhyolite Funnel Cloud

Puzzle: p. 15 Answer: p. 152

The six-letter word under STARTLING is STRING. The six-letter word under SPLATTERS is LATTER.

17. Piggyback Shuttle

Puzzle: p. 16 Answer: p. 152

You may be tempted to bypass ‘someone’ as a simple compound word: some/one. But it is also a piggyback word: som(eon)e.
‘Shuttle’ has the word ‘hut’ in it, but the surrounding letters (stle) don’t spell a word. Some words can piggyback in more than one way. For example, ‘bothered’ can be formed with ‘other’ in ‘bed’ or by ‘the’ in ‘bored.’

Hints - Part 2

18. Vision of Gold Puzzle: p. 17 Answer: p. 153

The text told you that "Nothing is really there." So look in the negative (white) space, not the dark outlines. Try to read the message and find something associated with gold.

19. Seeing Things Puzzle: p. 17 Answer: p. 153

The objects are items you might find in a tool kit. They are: ball peen hammer, C-clamp, file (or rasp), hand saw, level, pliers, power drill, screwdriver, tape measure, and wrench.

20. Roundhouses Puzzle: p. 19 Answer: p. 154

This puzzle comes with an "Aha!" moment. What if we didn't have to worry about the turning of those pesky roundhouses? If the circles didn't turn, we could solve the maze in short order. The "Aha!" comes when we realize that we can control the turning of the circles.

21. Curious Equation Puzzle: p. 20 Answer: p. 154

Notice where each person is located in the statement of the problem.

22. Matchstick Math – Digital Puzzle: p. 21 Answer: p. 154

1. We can only move one match, so we can't get the 12 down to a one-digit number. We can't change the operator from addition to multiplication. We need two numbers that add up to a double digit number (12).
2. We could change the plus to a minus, but that's not enough.
3. Changing the digits doesn't seem to work no matter what we do. Can we change the operator (the minus sign) instead?
4. There aren't many options here. We need to change the operator and a digit.
5. 9 - 7 = 2, but we don't have any extra matchsticks. Maybe we need to leave the digits the way they are and to work elsewhere.
6. Again we have a two-digit answer and no reasonable way to change the operator. We need to change the digits.
7. Is there anything we can do about that pesky two-digit number?

23. Word Prospecting Puzzle: p. 22 Answer: p. 155

In addition to precious metals, you can find other materials that are less precious but still valuable enough to dig up.

24. Is Siberia by Syria? Puzzle: p. 23 Answer: p. 156
The title of the puzzle is the best hint I can give you.

25. Addition by Twos Puzzle: p. 23 Answer: p. 156
Figure out how Y and Z are related. Then list four or five possible values for Z. For each of these values calculate W, X, and Y. Add the four numbers. If they total to 54, you have the answer.

26. No Left Turn Puzzle: p. 24 Answer: p. 156
This type of maze usually involves moving in ever-widening spirals until you can circle in on the destination. Look for streets that get you into the upper portion of the diagram. Then use little blocks to make three quick right turns to get yourself going to the left. Getting from Work to Home takes a very similar path.

27. Playing Post Office? Puzzle: p. 25 Answer: p. 158
The workers aren't doing postal service work, so ignore the fact that they are employed at the post office. The bag and the letters are small.

28. Voter Registration Puzzle: p. 25 Answer: p. 158
All voters are whole people, not fractional people. Figure out how many male voters there are and subtract that number from the total.

29. Alternating Current Puzzle: p. 26 Answer: p. 159
Working backwards from the end shows us that we must ultimately come across the top and down the right side of the diagram to solve the puzzle. The trick is to get moving in a clockwise direction. This means that we must reverse our charge somewhere. Where can we go through a charge circle and then return to the circle we passed through before (to go in the opposite direction)?

30. Murder Mystery 1 Puzzle: p. 27 Answer: p. 160
A good way to approach this puzzle is to start with the clues that eliminate some choices. Clue 3 and clue 5 eliminate four choices each. You should now be able to use clue 2 to determine the room! Use similar logic to find the murderer and then the weapon.

31. Murder Mystery 2 Puzzle: p. 28 Answer: p. 160

Clues 1, 2, and 5 each name a murderer, a weapon, and a room. Each of these clues also has exactly one element in the correct answer. A little thought should convince you that the nine elements mentioned in these clues must contain the three elements in the correct answer. Let's write these clues out in a table:

Sgt. Saffron	Telephone cord	Garage
Miss Crimson	Dumbbell	Foyer
Mr. Kelly	Poison	Washroom

Now use the remaining clues to eliminate elements that cannot be part of the correct answer.

32. Murder Mystery 3 Puzzle: p. 29 Answer: p. 161

Clues 3, 5, and 6 eliminate all of the rooms except the closet and the den. If the den is the murder location, Prof. Periwinkle and Ms. Bluebird are eliminated (clues 2 and 4). But this creates a problem with clue 1; Ms. Bluebird and the closet are eliminated, but the telephone cord was eliminated in clue 6. Therefore, the room cannot be the den.

33. Irrigation Puzzle: p. 30 Answer: p. 161

As you test the effects of closing certain valves, notice that the grid of pipes is quite tangled. If you think you have the answer, check to make sure the water can't double back through some circular path.

34. Word Building 3x3 Puzzle: p. 31 Answer: p. 162

Here are crossword puzzle style definitions for each of the nine-letter words. The clues are in alphabetical order of the words they define.

Group 1
__ Machine (voicemail)
Naval battle attack
Population
Type of pasta
Gum flavor
Consequently

Group 2	Poison countermeasures
	Yellow streak
	Streetlight standards
	Insane
	Perfidy
	Not brought to public notice
Group3	Italian appetizer
	Piazza
	Skydive
	Flag-waving
	Closeness
	Forte

35. Breaking the Sound Barrier Puzzle: p. 32 Answer: p. 162

The title of the puzzle implies that it has something to do with sound. Pronounce each phrase in a careful monotone. What do you hear?

36. Owling at the Sun Puzzle: p. 33 Answer: p. 163

All of the vowels are O's, and they are already provided. The remaining letters are consonants made up of straight lines only. A palindrome is a word or phrase that is spelled the same forwards and backwards. But in this case the spacing between words is different in the reverse direction. How many lines will make up each of the missing letters? The palindrome means that first and last letters will be the same. In fact, there will be at most three different consonants repeated to make the six letters.

37. So Hard Puzzle: p. 34 Answer: p. 163

Let's identify some key words: cushion, eye, hard to find, resist, punching, clothing, and strands. Think of unusual definitions/usages for the words. What is a famous old adage about something that is very hard to find?

38. O Pachink! Puzzle: p. 35 Answer: p. 164

For every puzzle put a dot in each square in the left column and a dot in each square where a ball exits the grid. If a ball exits the top row, that entire row must also be filled with dots. The dots indicate squares that can't contain blocks.

Then take careful note of how many blocks are to be used. If it is a low number, look for a simple solution where some of the balls roll straight across. If it is a high number, look for ways to cram extra blocks into areas that will never see a ball.

Next determine where the ball on the bottom row will exit the grid. Mark dots and blocks to make this ball exit where it should.

39. A Word in Common Puzzle: p. 38 Answer: p. 165

Think creatively. Try to come up with phrases that have the given words both first and last (e.g., sun ___ and ___ sun). The less common words are usually the best place to start (e.g., garden, quarter, or weld). Close your eyes (unless you're driving) and run through all of the phrases looking for common ground.

40. Head Off to the Rocks Puzzle: p. 39 Answer: p. 165

Here are some alternate clues for the defined words:

Amusement park attractions / Bad day for Caesar
Pig's noise / pigmented liquid for writing
Apple's center / Miner's unrefined mineral
Nutrient-rich green vegetable / The "A" in "IPA"
Equitable / What we breathe
Amount due but unpaid / Midweek abbreviation
Tricky stratagem / Employ, as a tool
More than a few / One or some
Another time / Opposite of loss
Sharp spike on a stem / Trumpet, for example
Utopian / Distribute playing cards
Opposite of closed / Writing instrument
Opposite of far / A spike of corn

41. Following Orders

Puzzle: p. 40 Answer: p. 166

When told to turn ‘at’ a roadway, you don’t have to turn **onto** it. Don’t stop looking for the answer to a question just because you think the trick is a misspelling. Be sure to properly determine the value of X. Be careful to obey rule 1 and know when questions are answerable.

42. Lost Silver

Puzzle: p. 42 Answer: p. 166

For the purposes of the puzzle ignore the story of the lost silver. Consider only my actions as stated before I recounted the story.

Hints - Part 3

43. Mine Cave-In Puzzle 1 Puzzle: p. 44 Answer: p. 167
The only move you can make at the start is push block C south. If you then push block D east, you will find that it is a trap. So continue to push block C south all the way to the bottom. Two more moves get you to the treasure.

44. Mine Cave-In Puzzle 2 Puzzle: p. 44 Answer: p. 167
Your first move must be either block A or block B; let's try A. Then pushing block E south (even one square) is a trap. Try pushing block D south. Two more moves get you to the treasure.

45. Mine Cave-In Puzzle 3 Puzzle: p. 45 Answer: p. 167
Your first possible moves are to push block B or block D south. Go ahead and push both blocks. Don't push block E to the east! Push block C instead, then F. If you did it right, you are on the way to victory.

46. Mine Cave-In Puzzle 4 Puzzle: p. 45 Answer: p. 167
You may want to print this one out and use coins to keep track of the moves. This one gets a little complicated. Don't fall for any traps that block you from moving where you need to go. Push block C for your first move.

47. Square Claims Puzzle: p. 46 Answer: p. 168
If your answer is less than the combined number of fingers on both of your hands, keep looking. Squares come in three sizes.

48. Hear Here Puzzle: p. 47 Answer: p. 168
This is a megaphone. Listen to what it is saying. Have you ever heard of mondegreens?

49. Time and Space Puzzle: p. 48 Answer: p. 168
Combine a word meaning 'the present time' with a word meaning 'the present place' and get a word meaning 'a lack of place.'

50. Turn, Turn, Turn Puzzle: p. 49 Answer: p. 169

If you could only go straight ahead at the first intersection, you could easily solve the maze. How can you reverse the pattern of turns without making a U-turn or driving backwards? Start by turning left at the first intersection.

51. Mark 10:31 Puzzle: p. 50 Answer: p. 169

This is a pattern recognition puzzle. Something about the spelling of the words is unusual. Not very many words have this characteristic. Most of these words start with the letter "S." If you still want another hint, consider the title of the puzzle. It refers to a quotation that describes the unusual characteristic.

52. State the Headlines Puzzle: p. 51 Answer: p. 169

Start by addressing the number of letters in each word. The words always have an even number of letters, but that isn't very unusual. Six- and eight-letter words constructed in this manner are rare. The word MAIL has this unusual characteristic. All the letters are capitalized.

53. Even Three Times Puzzle: p. 52 Answer: p. 170

Which letter represents the zero? It can't be A or C; leading zeros aren't allowed in math problems. If it is B or E, the other letter must be zero as well. So D represents zero. What value can C have? That will determine A. Keep going.

54. Grow in the Middle Puzzle: p. 53 Answer: p. 170

Any help I provide will give away the answer. Just try to visualize two letters filling the middle of each word.

55. River-Hidden-River Puzzle: p. 54 Answer: p. 170

Here are some additional examples of words in each group.

```
1.  M I _ _ O N     2.  R E _ _ N S
    S I _ _ E T         O R _ _ I N
    M A _ _ U M         A L _ _ H T
```

3.	F	R	_	_	P	E	4.	C	U	_	_	E	W
	E	L	_	_	S	E		B	A	_	_	E	D
	G	R	_	_	H	S		J	A	_	_	U	L
5.	G	A	_	_	S	T	6.	C	O	_	_	O	N
	F	O	_	_	R	S		P	A	_	_	E	R
	C	O	_	_	S	T		S	T	_	_	O	R
7.	H	A	_	_	E	D	8.	E	X	_	_	S	E
	S	I	_	_	E	R		O	C	_	_	L	T
	V	E	_	_	E	T		V	A	_	_	U	M

56. Shifting Sands Puzzle: p. 55 Answer: p. 170

You don't have to wait until all of the sand runs out of a timer before you turn it over again. Start by turning over both timers at the same time. By adding and subtracting measures from both timers you can come up with 9 and ten minutes.

57. Front-End Loading Puzzle: p. 56 Answer: p. 171

Here is the answer to the first line of words. Place the word 'do' in front of each word on the first line to form

1. dozen, docent, dogear, dosage, and donation.

Remember that each two-letter prefix is a word, not just two letters.

58. Target Ninety-Nine Puzzle: p. 57 Answer: p. 171

Instead of trying every possible combination of numbers, let's start with a little insight. Notice that all of the target values are odd numbers. If we add two odd numbers, it always results in an even number. Adding four odd numbers gives an even number. Therefore, one of our arrows must hit the non-scoring area or miss the target entirely.

59. Crop Circle/Squares Puzzle: p. 58 Answer: p. 172

The inner square fits exactly into the circle, but it is possible to draw the illustration such that the inner square touches the outer square. Then the answer to the puzzle becomes much more obvious.

60. Four Card Logic Puzzle: p. 58 Answer: p. 172

Item 4 implies that there are two face cards and two number cards. There are no aces (item 2), so face cards must be in the highest ranking positions (3 and 4). Item 5 tells us that one number card is four higher than the other. Item 2 tells us that one number card is a five. The number cards can only be five and nine, because there are no aces (see item 2)

61. Anagram Quints Puzzle: p. 59 Answer: p. 173

One way to approach this puzzle is to start with the word that has the most unusual letters (because there are probably fewer words that could be formed). You must rearrange the letters (according to the instructions), so don't leave them in the same order. Arrange the four letters you know and try a few added letters to form a word. If you can find a letter that works as the added letter in one word, try it in another word.

62. Boxed Rebus Puzzles 1 Puzzle: p. 60 Answer: p. 173

Here are some basic steps you can take to start solving a rebus:

1. Identify the pictures and determine the words they suggest.
2. Pronounce the words or syllables that are written out.
3. Add relational words like on, in, under, etc. if they apply.

Here are clues hinting at the meaning of the deciphered phrases:
Top row: A bite into your purchasing power | Jeepers
Second row: Favorite | Expecting something that didn't happen
Third Row: An affair in the country | Exactly right

63. Boxed Rebus Puzzles 2 Puzzle: p. 61 Answer: p. 173

Here are clues hinting at the meaning of the deciphered phrases:
Top two rows: Easy Street | Short time span
Middle rows: Final attempt | Small quantity | Whoopee!
Bottom Row: Make a thorough search

64. Rebus Category 1 Puzzle: p. 62 Answer: p. 174

Here are some hints with the tougher puzzles. The lower case 'b' indicates the letter's sound; uppercase letters ask you to pronounce the letter's name, like 'bee'. The girl is Scottish. The speech balloon is asking for what the crow is saying, not looking for the word 'crow' itself. The 'c' is IN 'nam' and ON the rolling ball. The soap is meant to be a 'cake'. After the apples, we see a soda straw, someone burying something, and a compressed word. The eye is shouting.

65. Rebus Category 2 Puzzle: p. 63 Answer: p. 174

The fellow with the fancy collar is William Shakespeare. The triangle is a pool table's rack. The shouter is yelling "O". The horse's tack is a 'lead'. The candy on a stick is an all-day ___. Pronounce the capital letters and symbols by their names. The lower case 's' is just the 's' sound. 'War' isn't in focus.

66. Rebus Category 3 Puzzle: p. 64 Answer: p. 174

We are looking for the actions that the two men are doing. The first bird pictured is a sea gull; the others are not any specific species. In the fifth puzzle, we aren't looking for a type of bird. We are looking for a synonym for 'beak'. The wormlike creature is a leech.

67. Speedway Puzzle: p. 65 Answer: p. 175

Getting up to speed = 6 on the eastward straightaway would have our car crashing into the far wall; we could not decelerate quickly enough. You will also benefit from a wide turn.

68. Primer Subject Puzzle: p. 66 Answer: p. 176

Each of the words has more than one definition, but that is not unusual enough. Read the words to a friend. By the way, the words in the puzzle's title ('primer' and 'subject') both have the same unusual characteristic.

69. Crash Course Puzzle: p. 66 Answer: p. 176

Jeff seems to be in control of his vehicle. He's not just a passenger. But the story never says that any of the vehicles are cars, and it never says that the bird lands on the road in front of him.

70. Prickly Pairs Puzzle: p. 67 Answer: p. 176

Think of common two-word phrases as you match up the pairs. The second group is related to the first but harder.

71. Equation Puzzle: p. 68 Answer: p. 177

Since the numbers must be different, we can't set both equal to zero. If both numbers are positive integers (like 1 and 2), the product will always be greater than the difference.

72. Sequence 24 Puzzle: p. 68 Answer: p. 177

The next entry in the sequence is also the only other entry because the sequence repeats.

Hints - Part 4

73. Hex Checkers Puzzle: p. 69 Answer: p. 178

Because of symmetry, there are really only four possible starting moves. The puzzle can be solved in only three moves. In our solution the first move is not a jump.

74. Summer Squares 100 Puzzle: p. 71 Answer: p. 178

The first two puzzles aren't tricky. Just find the proper combinations from among the squares: 1, 4, 9, 16, 25, 36, 49, 64, and 81. The other two tasks require finding other perfect squares. If you're not positive about what integers are, consult a reference text.

75. Coaster Challenge Puzzle: p. 72 Answer: p. 179

Three simple rotations (positions 3 & 4, positions 2 & 3, positions 4 & 5) will alternate the hearts and spades, but the orientation of the symbols won't match the desired result. What can you do to get the heart-below-spade pairings that appear at the edges of the final diagram? Why is there so much empty space on the table?

76. Circuit Board Puzzle: p. 73 Answer: p. 180

The E-to-E connection would seem to cross B-to-B and D-to-D lines. At least one of these troublesome connections will have to go above the row of A, B, C, and D. If you figure out where the lines for E and B go, the other connections fall into place.

77. Five Little Pigs Puzzle: p. 74 Answer: p. 180

You need to place two squares in such a way that there are five enclosures. The enclosures don't need to be rectangular, and they don't all have to be the same size.

78. Matchstick Math – Roman Puzzle: p. 74 Answer: p. 180

1. You can't remove a match; otherwise you could just change the 3 to a 2. If you can't change the 3 on the right, can you change the expression on the left to equal 3?
2. If you take one match from the 3 and make it a two, where could you place the match you removed?
3. This one involves changing more than just the numbers.
4. This one doesn't change any numbers at all!
5. There are two ways to do this one: either increase the value on the left or decrease the value on the right.
6. What is the relationship between 10, 2, and 5. Can you make the operator match that relationship?
7. The left side of the equation is huge compared to the right. Can you make the right side much greater?
8. This one involves changing a number to create a new operator.
9. You can't change the II into V because that would require tilting both matches. This one calls for making an operator into a number and making a number into an operator.

79. Fill Two Blanks Twice Puzzle: p. 76 Answer: p. 182

This puzzle involves pattern recognition and vocabulary recall. Try forming words. Then check to see if the letters you added repeat. Try filling one of the blanks with a likely letter and see if any words come to mind. If you really get stumped, set the puzzle aside for a while and look at it with fresh eyes later.

80. Faulty Calculator Puzzle: p. 77 Answer: p. 183

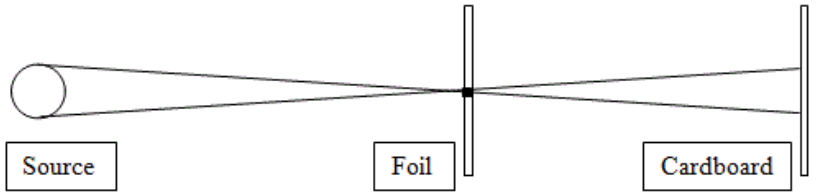
There are two basic approaches we can use:

1. Pick a number and see which displays could match it,
2. Pick a display and see which numbers it could match.

As an example of the first approach, let's choose the zero. There are only four displays that could be the zero (the third and fourth display on the each row). As an example of the second approach, the last display could only be a 6 or an 8. Apply either approach to all the displays and then begin a process of elimination.

81. Eclipse Image

Puzzle: p. 78 Answer: p. 184



A pin hole 'lens' inverts an image right-to-left and top-to-bottom. The light from the lower half of the sun is projected at the top of the image on the cardboard. The light from the left side of the sun is projected at the opposite side of the cardboard. But that isn't the only thing that changes when you use the projection method to view the eclipse.

82. Mined Blocks 1

Puzzle: p. 81 Answer: p. 185

Don't let yourself get trapped so that you can't get back to the exit. Be careful where you push Block D. Also be careful how you get across the bottom (south end) of the diagram.

83. Mined Blocks 2

Puzzle: p. 82 Answer: p. 185

Ignore the southwest corner of the diagram; it's a trap. Be careful where you put Blocks D and B. Get these blocks out of the way in the following order: Block A, Block D, Block G, and Block B. If you do it correctly, you now have an open path from the exit to Block C.

84. Mined Blocks 3

Puzzle: p. 83 Answer: p. 185

Open a pathway along the east edge of the diagram before pushing Block F back into its original position. Block I must also be moved back to its original position before you can escape out the northwest corner.

85. Mined Blocks 4

Puzzle: p. 84 Answer: p. 186

Use the arch and get Block C out of the way. Use another arch to move Block I out of the way.

86. Mined Blocks 5 Puzzle: p. 85 Answer: p. 186

Block C needs to be moved out of the way. But Block E poses a bigger challenge. Don't let Block E keep you from escaping.

87. Perfect Square Combos Puzzle: p. 86 Answer: p. 187

Feel free to use some of the numbers more than once. My answer doesn't have four ***different*** numbers.

Choose any two of the four numbers in the answer; their sum = a^2, where a is an integer. The sum of the other two numbers = b^2, where b is an integer. The sum of all four numbers = c^2, where $a^2 + b^2 = c^2$.

88. Who Am I? Puzzle: p. 86 Answer: p. 187

David is a human being who is loved by his family. He doesn't have dementia, but his condition is related to his age.

89. pHoneymoons Puzzle: p. 87 Answer: p. 187

Crescent moon: Look closely at the position of the stars.

Half moon: Where is the sun in this picture? It is the light source for the moon.

Shooting star: A shooting star (meteor) is caused by an object burning up in the earth's atmosphere.

Big Dipper: There are two reasons why this couldn't happen; both require some knowledge of the Big Dipper constellation. First, the moon is drawn much too large compared with the constellation of stars. The second requires a little more knowledge of the moon's path.

Near Venus: When the moon is full and near the horizon, the sun has just set or is about to rise. Around sunrise and sunset is when we always see Venus (because Venus is an inner planet, closer to the sun than earth). We see the moon near Venus quite often. So why don't we ever see the full moon near Venus?

90. Gallery Puzzle: p. 88 Answer: p. 188

Ignore the illustration. To solve this riddle, you need to expand your definition of artist beyond a painter. Start by thinking of theatrical artists and what they "draw" (think of another

meaning for the word "draw"). The answer is something composed of people not composed by people. Continue to look for alternate meanings of the words used in the poem.

91. Pay Me Puzzle: p. 88 Answer: p. 188

OK, the verse sounds like it's written by Yoda, but can you work out the riddle? The answer is synonymous with care, tending, consideration, notice, concentration, and (to) mind. "Pay" is part of an idiom formed with the answer word.

92. One-Cut Checkerboard Puzzle: p. 89 Answer: p. 188

Making a single cut along the lines of the grid won't solve the problem. We know this because the odd-shaped piece is 10 squares tall and 10 squares wide. Our goal is an 8x8 checkerboard, so no piece can be longer than 8 squares. This requires two cuts (one horizontal and one vertical) if we cut along the lines on the board. Although you are allowed to make only one cut, the shape of the piece allows that single cut to create more than two pieces.

93. What Goes Around Puzzle: p. 90 Answer: p. 190

Probably the best way to attack this puzzle is to look at possible letters for the second position. What letters might go between the G and O? Likely candidates: L, N, O, R. Other possible letters: A, E, H, U, W. Other letters are so unlikely that we can probably ignore them. At least one of the less likely letters will be needed to form the five words.

G _ O _ E S

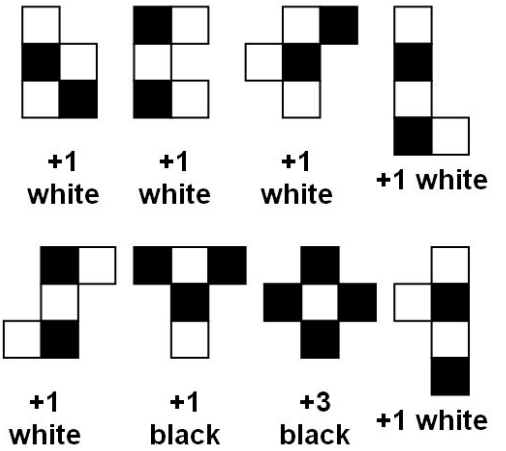
94. Short i, as in Fit Puzzle: p. 90 Answer: p. 190

You have already received all the hints you need. The five words you are searching for are quite common.

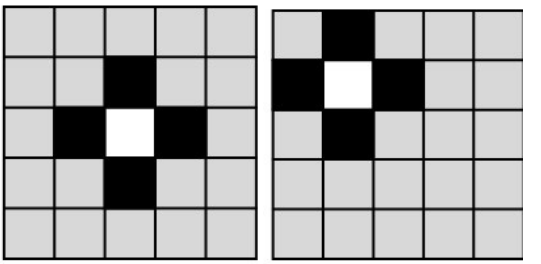
95. Pentomino Checkerboard

Puzzle: p. 91 Answer: p. 190

The 5x5 pattern will have 12 squares of one color and 13 squares of the other color. The five pieces you choose must match this 12/13 relationship. The following chart will help to decide which pieces to choose:



6 of the 8 pieces have one extra white square. The only way to balance the black and white squares is to choose the X as one of your pieces. If you also choose the T, you will have 13 black squares. Otherwise, you'll have 13 white squares. If you have more white squares than black, you will have white squares in all four corners. This forces the X piece to the center of the board; anywhere else will prevent you from filling a corner with a white square.



A little trial-and-error experimenting should quickly convince you that there is no way to fill the 5x5 grid with the X in the center. The available shapes can't fill all the corners. Therefore, the pattern needs to have more black squares than white. That means you'll need to choose the T as well as the X.

Now you know two of the five pieces and that all four corner squares will be black.

96. Some Totals

Puzzle: p. 92 Answer: p. 191

Add up all eight cards and divide by two to find out what each column should total to. Oops. That indicates that each column should total to 19½ . Something is wrong. We're going to have to do something tricky to make both columns equal. You are not allowed to tear cards in half or otherwise deface them.

By the way, why were the numbers written on cards instead of just being written as numbers?

97. Jigsaw Message 1

Puzzle: p. 93 Answer: p. 191

98. Jigsaw Message 2

Puzzle: p. 93 Answer: p. 192

99. Jigsaw Message 3

Puzzle: p. 93 Answer: p. 192

The hints for these three puzzles are included with the puzzles.

100. Equal Areas

Puzzle: p. 94 Answer: p. 193

There are two kinds of regions (circle and annulus) in the diagram. An annulus is a ring (like a zone on an archery target). Adjacent annuli (plural of annulus) can be grouped to define a fatter ring. Therefore, there are a total of 36 different regions (8 circles and 28 annuli). Find two regions in the diagram that have the same area. Then find four more pairs of regions with the same area.

annulus and circle

The area of each circle is pi times the radius squared ($A = \pi r^2$). The area of each annulus is the area of the outer circle minus the excluded inner circle's area. We'll ignore pi because every region's area is a multiple of pi, and we're only interested in comparing areas. The circles have areas of 1, 4, 9, 16, 25, 36, 49, and 64. There are five cases where two regions have the same area.

101. Domino Mosaic Puzzle: p. 95 Answer: p. 195

See the hint for puzzle102 (Domino Jigsaw 1). It outlines an approach to solving this type of puzzle. But notice that for this particular puzzle, you can see the actual dominoes and can use the orientation of some of them to further determine which is which.

102. Domino Jigsaw 1 Puzzle: p. 96 Answer: p. 196
103. Domino Jigsaw 2 Puzzle: p. 97 Answer: p. 197
104. Domino Jigsaw 3 Puzzle: p. 97 Answer: p. 199

My approach to solving a domino jigsaw involves three basic steps:

Step 1. Select a domino (pair of numbers) and find a pair of numbers on the grid that is the only possible place that domino could go.

Step 2. Looking only at the grid, find two adjacent squares that must be a domino pair because they are hemmed in by other dominoes.

Step 3. Using the number pairs discovered in Step 2, block boundaries between unused numbers on the grid that match the Step-2 pairs.

Keep repeating the three steps until you've solved the puzzle. The solution shows you step by step how this is done.

Hints - Part 5

105. UFOs

Puzzle: p. 100 Answer: p. 201

1. The mysterious light was not a reflection; it was a physical object. It must have been brighter than a typical star, so it is surprising that no one noticed it at the time. It is always hard to guess how big or how far away a UFO actually is. But if it was far away, it went from zero to Mach four almost instantly and with no sonic boom.

2. The UAP was definitely in the sky next to the mountains. It was several miles away and more massive than any human-made aircraft. I like the fact that there was enough natural light to see it without any lights of its own. I have never understood why aliens would call attention to themselves by lighting up their spaceships.

3. I saw and heard a flying object directly overhead. The spinning wheel of lights definitely gave the vehicle the look of a traditional flying saucer hovering low above me. As it drifted away, my perspective changed, and I was able to determine what it was and why it was there.

4. This light (or lights) came almost directly toward me. The fact that it seemed to rise was an illusion; it flew at about the same altitude as long as I saw it. When it was high in the sky, I heard a rumbling sound and saw some colored lights accompany the original object(s).

5. The light moved slowly, silently, and steadily from south to north. It was not particularly bright. And suddenly it was gone. But I didn't imagine it.

106. The Sailing Stones

Puzzle: p. 102 Answer: p. 202

These scars on the playa only form when the rocks are in shallow water that freezes over night and then partially thaws the next morning. The wind is a breeze that doesn't need to be too strong. Videos show that the rocks are actually scraped across the lake bed.

107. Cryptic Crossword 1 Puzzle: p. 106 Answer: p. 203

The types of clues used in this puzzle are as follows:

Across – 1. Charade, 6. Hidden, 7. &Literal, 8. Hidden Reversal, 9. Homophone.

Down – 1. Anagram, 2. Deletion, 3. Homophone, 4. Container, 5. Anagram.

108. Cryptic Crossword 2 Puzzle: p. 106 Answer: p. 204

The types of clues used in this puzzle are as follows:

Across – 1. Deletion, 6. Container, 7. Anagram, 8. Hidden, 9. Hidden.

Down – 1. Two Meanings, 2. Charade with Anagram, 3. Two Meanings, 4. Deletion and Reversal, 5. Container and Reversal.

109. Cryptic Crossword 3 Puzzle: p. 107 Answer: p. 205

The types of clues used in this puzzle are as follows:

Across – 1. Homophone, 6. Container, 7. Deletion, 8. Anagram, 9. Hidden.

Down – 1. Charade, 2. Two Meanings, 3. Charade, 4. Charade with Reversal, 5. Palindrome.

110. Cryptic Crossword 4 Puzzle: p. 107 Answer: p. 206

The types of clues used in this puzzle are as follows:

Across – 1. Reversal, 6. Anagram, 7. Deletion, 8. Homophone, 9. Initials.

Down – 1. Container, 2. Container, 3. Two Meanings, 4. Charade, 5. Hidden.

111. Four Gallons Out Puzzle: p. 108 Answer: p. 207

Challenge 1 – You can pour liquid from one container to another to arrive at different amounts. For example, filling a 3-gallon container from a full 5-gallon container leaves 2 gallons in the larger vessel.

Challenge 2 – You must get much more creative here. Note that the containers are perfect cylinders. Don't just set them on the ground when you fill them.

112. Put Your Cards on the Table

Puzzle: p. 109 Answer: p. 208

We'll need to switch the clubs and spades in row 2 or in row 4. That will use up two of our four moves. Those two moves will have to help adjust the counts in some columns and rows as well. Look at the totals of each row and column and recognize that at least one of those starting totals must be the one we end with.

Be sure that you always place cards on the table that aren't already there. We have a tendency to think of a card we need without realizing that it is already in play on the table.

113. How Like a Dove

Puzzle: p. 110 Answer: p. 210

The entire word is like a dove that flies. It could even fly over the first syllable, which appears to be an animal (omnivore). The animal is later eaten by humans. The second part is a very long unit of time.

114. Play with Me

Puzzle: p. 110 Answer: p. 210

There is some technical jargon here that might make this hard. There are special meanings for "rail", "leg", "wing", and "hands." None of them refers to a living thing. The best clue is probably the final line.

115. One Black Knight

Puzzle: p. 111 Answer: p. 210

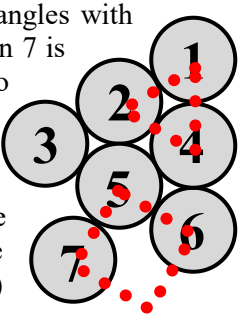
The first move must be to QB4 (between the black and white pawns) because any other move would allow White the chance to capture the knight immediately (if White is allowed a turn). Obviously the black knight cannot land on any square already occupied by a black piece. The second move will only allow K5 or a return to the original QR3 square. At move three, there are two possible directions; so, I suggest working backwards from the goal for a while.

Working backwards, all squares that are one knight's move away from the "X" are guarded by white. Have we proven the puzzle to be impossible? No, look closely to discover a way to win.

116. Coin Arrowhead

Puzzle: p. 112 Answer: p. 212

Notice that all the coins form equilateral triangles with each other except for the 'tail' (coin 7). Coin 7 is the only coin in a square geometry relative to the others. You must end up with a coin in this same square geometry when the new tail is placed at the far right. Each move you make must maintain a square shape somewhere in the design. So your first move must touch coin 7 (to maintain the square) but not move coin 7.



There are two basic ways to make this first move:

1) Slide coin 1 (or 3) to touch both coin 6 and coin 7, or
2) Slide coin 6 (or 3) to touch both coin 5 and coin 7

In the second case, the square shape is kept as coins 4, 5, and 6.

Either of these two moves can get you to a solution, but remember that you want to solve the puzzle by moving the fewest coins, not necessarily the fewest 'moves.' Our answer moves two coins in four moves.

117. Covered Spheres

Puzzle: p. 113 Answer: p. 213

You don't have to be really smart to solve this one; in fact, you can be downright dense. You do need to know some science. You don't need to know the formula for the volume of a sphere (which is $V = 4/3\ \pi\ r^3$, if you must know). You would need about 2.1 cubic inches of water to cover the four balls. But we are using liquid mercury. It makes a difference.

118. Dicey Situation

Puzzle: p. 114 Answer: p. 213

Statisticians determine probabilities by building tables of possible outcomes. You can do the same thing by choosing two dice and listing all of the possible outcomes of rolling one against the other. For example, A could roll 1 and B could roll 2; B wins. Each pair of dice has nine possible outcomes. Which die wins more often? What about the other combinations of dice?

119. 4x4 Grouping

Puzzle: p. 115 Answer: p. 213

The best hint I can suggest is to solve the puzzle as a 'group' with one or more other people. With multiple people, you'll find that the pictures are easier to identify, and there are more suggested categories to work with.

If you are doing it by yourself, it is a big help to know what the pictures were intended to be (top to bottom, left to right): Table or bench, noon, cigar, pants or trousers, torch, level, kayak, candle, French doors, rocket, French fries, centipede, French toast, roast chicken, French horn, and radar.

120. Laser and Mirrors

Puzzle: p. 116 Answer: p. 214

Challenge 1: Nothing in the statement of the problem requires the beam to stay inside of the large triangular area. My solution (one of many possible answers) traces sort of an argyle pattern.

Challenge 2: My solution is very straightforward, but all of the eight mirrors are set up outside of the large triangular area.

Challenge 3: My solution uses both of the given mirrors to reflect the beam. I think you'll have to use at least one of the pre-positioned mirrors for any solution.

Challenge 4: You may actually find this puzzle easier than the others because you get to bypass three areas. Take advantage of the two long edges (with nine areas in a row). Then bounce into the inner hexagon.

Challenge 5: My solution is more off-beat than the previous ones because some of the mirrors are set at unusual angles. The beam, however, always stays parallel to one of the three sides and travels through the center of areas. A mirror interrupts the path along one of the long edges for a side trip into the interior.

Answers

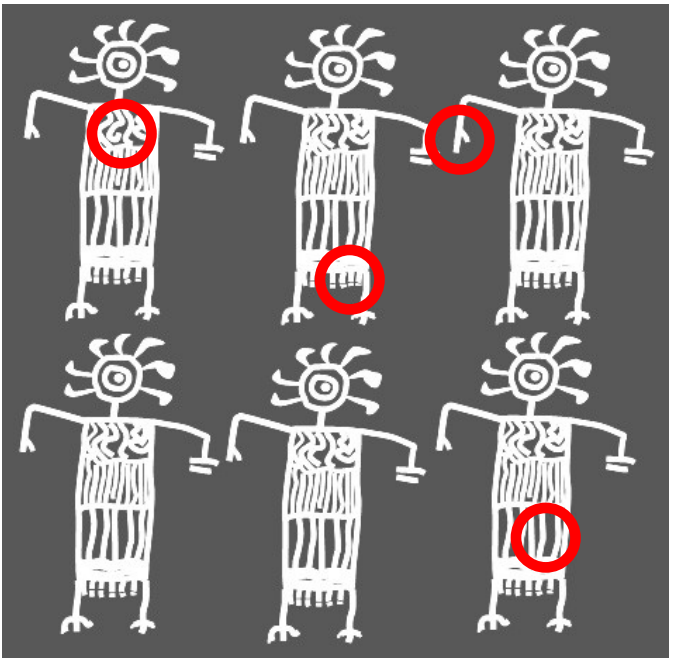
Part 1: Answers

1. Tumbleweed Puzzle: p. 3 Hint: p. 119

The route to follow spells OVER THE HILL AND ON A ROLL.

2. Find the Twins Puzzle: p. 4 Hint: p. 119

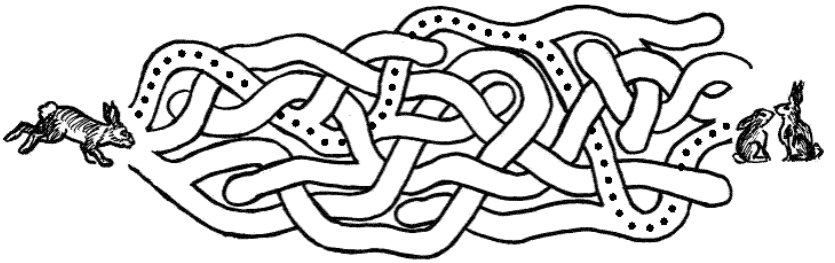
The twins are the fourth and fifth figures. Differences are found in chest plate, the fringe, the hand, and lower part of the robe.



3. Rabbit or Jackalope?

Puzzle: p. 5 Hint: p. 119

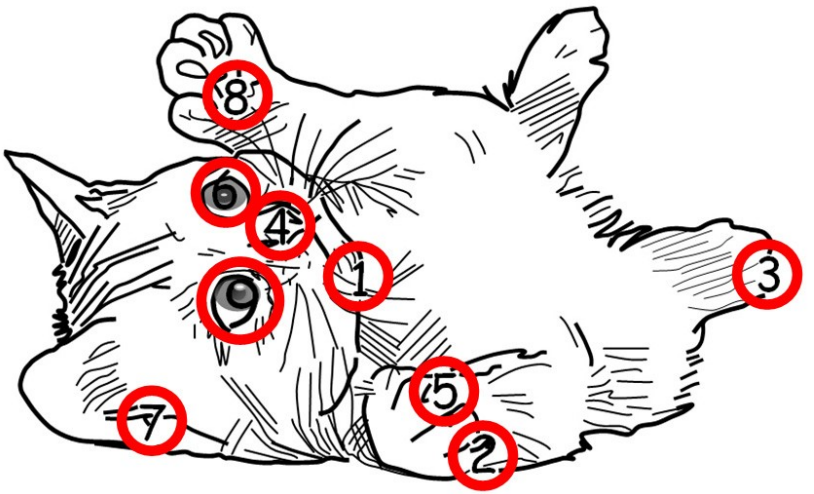
Your mind has to "see" the path as it weaves under other paths. Otherwise, this is a very easy maze.



4. Nine Lives

Puzzle: p. 6 Hint: p. 119

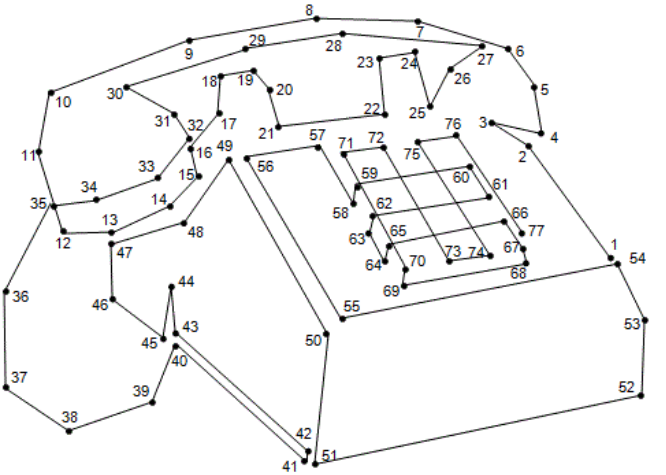
The nine lives are represented by the digits 1 through 9. Here is where we hoped you'd find them:



5. Constellation Connecting

Puzzle: p. 7 Hint: p. 119

The picture shows a push button telephone circa 1980. The lines on the face of the dial cross each other so that the details there aren't suggested by any dots.

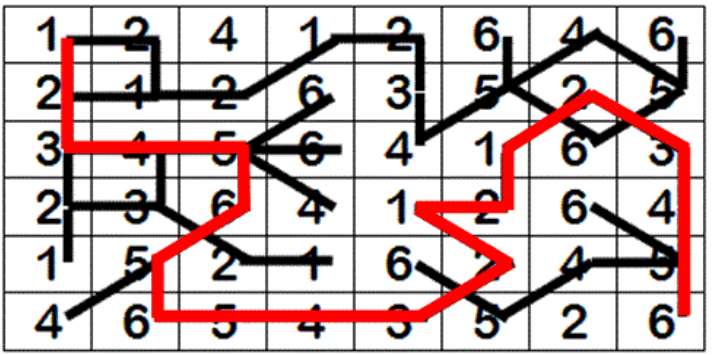


6. One Difference Maze

Puzzle: p. 8 Hint: p. 119

Start in the upper left-hand corner of this grid and move in this number sequence:

1, 2, 3, 4, 5, 6, 5, 6, 5, 4, 3, 2, 1, 2, 1, 2, 3, 4, 5, and 6.



7. Alphabetical Order

Puzzle: p. 9 Hint: p. 120

The letters within each word appear in alphabetical order. For example, in “chintz” the C is before the H which is before the I and so on. The letters in “act” are in alphabetical order, but the letters in “cat” are not.

8. Irregular Verbs

Puzzle: p. 9 Hint: p. 120

Here are some examples of verbs where the past tense is formed by removing a letter or letters from the present tense.

bite/bit	breed/bred	choose/chose	feed/fed
hide/hid	lead/led	light/lit	meet/met
shoot/shot	slide/slid	speed/sped	

The write-up about Robbers Roost contained the words hideout and shoot. Also, the Hint for this puzzle included the following words:

choose meet bit light lead fed

9. Blythe Geoglyphs

Puzzle: p. 10 Hint: p. 120

The message in this puzzle was intended to be read from the highway at ground level, but it was drawn on a horizontal surface. If you set the book flat on the table and look at it with your eyes near the table top, the tall letters compress to look like this:

Drivers along the highway could read the message but aviators overhead could not.

10. Sign Language

Puzzle: p. 11 Hint: p. 120

If sign 1 is wrong, not even one sign is right. But signs 2 and 4 can't both be wrong at the same time (if 4 is wrong, then 2 must be right). Therefore, sign 1 must be right.

Signs 2 and 4 can't both be right at the same time, either. Therefore, sign 3 must be right (at least one sign is wrong).

If sign 4 is right, then the only sign that is wrong must be 2. But then 2's message would be right, and this is a contradiction. Therefore, sign 4 must be wrong and sign 2 must be right. All signs are right except sign 4.

11. Kids and Pets

Puzzle: p. 11 Hint: p. 120

Chuck is older than the boy with the dog. The boy with the dog must be Wallace, not Mary (a girl). The ten-year-old is neither Chuck (not the youngest) nor Wallace (not the cat owner). Mary is 10 and owns the cat. Wallace is 11 and owns the dog. Chuck is 12 and owns the chuckwalla. Your answer will differ if you think Mary is a boy.

12. Give Me a Break

Puzzle: p. 12 Hint: p. 120

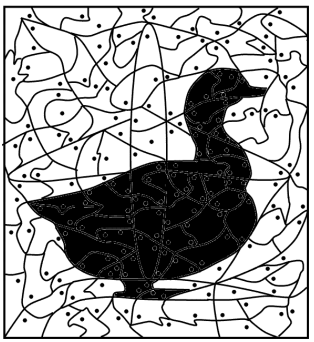
The 'breaks' in these sentences hide the true meanings.

1. Get a grip.
2. I'll go down swinging.
3. It's hot as Hades.
4. You can't win them all.
5. Read you the riot act.
6. You reap what you sow.
7. So, physician, heal thyself.
8. Strike while the iron is hot.
9. Close the stable door after the mare has gone.
10. There are none so blind as those who will not see.

13. Paint by Numbers

Puzzle: p. 13 Hint: p. 120

You draw the silhouette of a rather chubby goose when you darken the cells containing two dots.



14. Sprocket Science

Puzzle: p. 14 Hint: p. 121

If one gear is turning in the clockwise direction, the gear it is meshed with will turn in a counter-clockwise direction. Two pulleys connected by an untwisted loop will turn in the same direction. If you twist the loop connecting two pulleys, they will turn in opposite directions. The weight (A) will rise, because the gear on the right will turn clockwise and reel in the cord attached to the weight.

15. Mixed Doubles

Puzzle: p. 14 Hint: p. 121

aye+sake = ice hockey
Bach+sing = boxing
bass+bawl = baseball
chi+yakking = kayaking
heard+dulls = hurdles
high+lye = jai alai
lock+craws = lacrosse
psi+cling = cycling

16. Rhyolite Funnel Cloud

Puzzle: p. 15 Hint: p. 121

STARTLING, STARTING (or STARLING), STARING, STRING, STING, SING, SIN, IN, I.

SPLATTERS, SPLATTER (or PLATTERS), PLATTER, LATTER, LATER (or LATTE), LATE, ATE, AT, A.

Other 'funnel cloud' words include DROWNINGS, CLEANSERS, SPLITTING, and STRAPPING.

17. Piggyback Shuttle

Puzzle: p. 16 Hint: p. 121

som(eon)e	be(cam)e	bo(the)red	f(law)ed
to(tall)y	air(worth)y	de(sign)er	f(ores)ight
ad(vise)d	a(gains)t	op(era)ting	wea(the)r
t(went)ies	th(ink)ing	end(anger)ed	

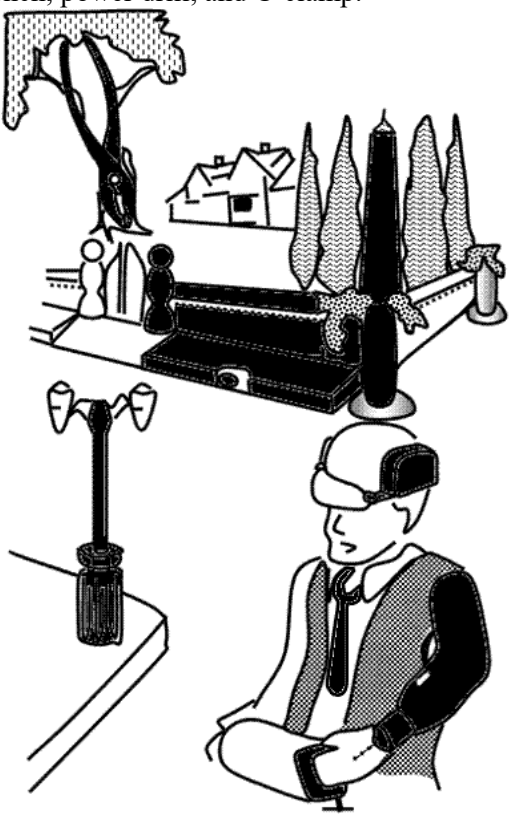
Part 2: Answers

18. Vision of Gold Puzzle: p. 17 Hint: p. 122

The mirage is in the negative (white) space of the figure. It says "the fiftieth." The traditional gift for the fiftieth wedding anniversary is gold.

19. Seeing Things Puzzle: p. 17 Hint: p. 122

The objects are items you might find in a tool kit. They are: pliers, file (or rasp), ball peen hammer, hand saw, level, screwdriver, tape measure, wrench, power drill, and C-clamp.



20. Roundhouses

Puzzle: p. 19 Hint: p. 122

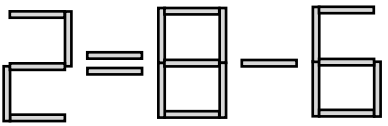
This puzzle comes with an "Aha!" moment. What if we didn't have to worry about the turning of those pesky roundhouses? If the circles didn't turn, we could solve the maze in short order. The "Aha!" comes when we realize that we can control the turning of the circles. The instructions state that "***every time*** you enter a path through one of the roundhouses..." the path will change from north-south to east-west orientation, or vice versa. This means that all you have to do is go out of and then come back into the circle to change the way it points.

Here is a solution to the maze: Find your way to the roundhouse in the upper left-hand corner. Enter it and exit in either direction (north or south). Immediately re-enter the same roundhouse and exit to the east. Find your way to the roundhouse in the lower left-hand corner. Enter it and exit in either direction (east or west). Immediately re-enter the same roundhouse and exit to the south. Make your way to the exit.

21. Curious Equation

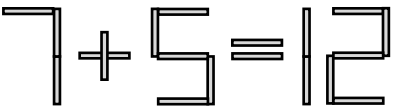
Puzzle: p. 20 Hint: p. 122

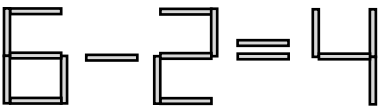
My granddaughter was working from the other side of the desk; so I was seeing the equation upside down. Right side up, the equation was:

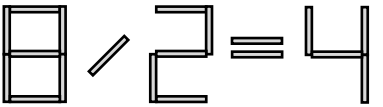


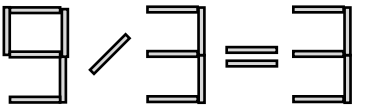
22. Matchstick Match - Digital

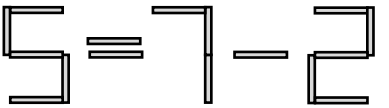
Puzzle: p. 21 Hint: p. 122

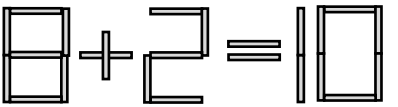
1. 

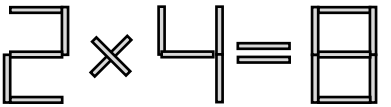
2. 

3. 

4. 

5. 

6. 

7. 

23. Word Prospecting

Puzzle: p. 22 Hint: p. 122

1. "Getting old is no picnic," Kelly moaned.
   TIN GOLD NICKEL
2. My search might lead to topaz in clay deposits.
   LEAD TOPAZ ZINC CLAY
3. The rookie cop permits altercations as my neighbor axes the tree.
   COPPER SALT BORAX
4. We must repair one fossil very soon.
   IRON FOSSIL SILVER
5. We catch Rome's consul furnishing more dental care.
   CHROME SULFUR ORE TALC

24. Is Siberia by Syria?

Puzzle: p. 23 Hint: p. 123

Each of these phrases is a spoonerism for a familiar phrase:

Make it from tea	Take it from me
Winning your spiels	Spinning your wheels
Fight a liar	Light a fire
Bit the hooks	Hit the books
Bunny phone	Funny bone
Chain wreck	Rain check
Warty finks	Forty Winks

25. Arithmetic by Twos

Puzzle: p. 23 Hint: p. 123

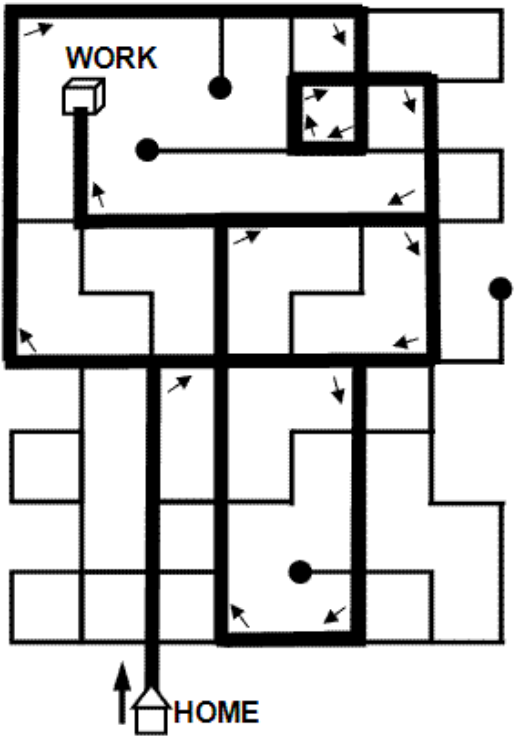
W = 10, X = 14, Y = 6, Z = 24

Z = 4 × Y, so Z must equal	12,	16,	20,	24,	28,	or 32
and Y =	3	4	5	6	7	8
and X =	8	10	12	14	16	18
and W =	4	6	8	10	12	14
and the sum of all =	27	36	45	**54**	63	72

26. No Left Turn

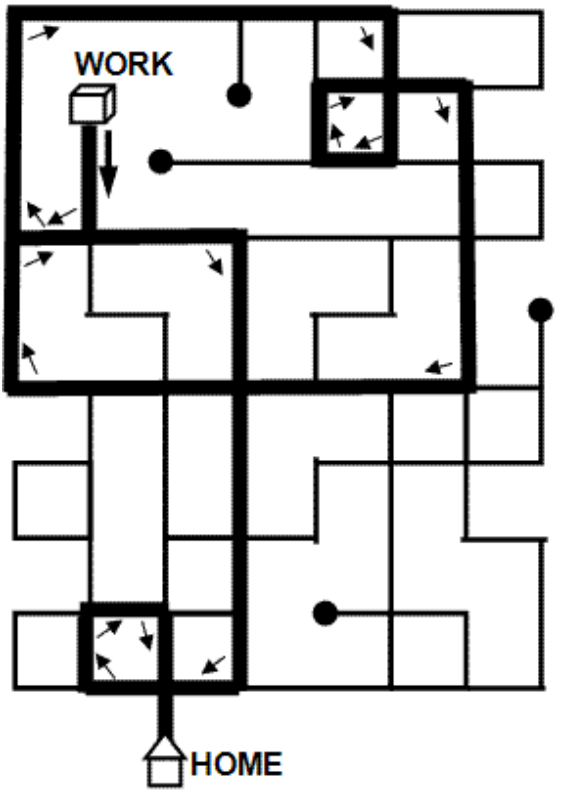
Puzzle: p. 24 Hint: p. 123

Turning at the first cross street ends at a bend in the road at the end of the street. The next two cross streets allow you to circle around several ways but really don't help much. Turn right at the fourth cross street and then right again at the second opportunity to turn right. Turn at the end of that street (at the T-shaped intersection). Then turn right as soon as you can. This street will get you into the upper half of the map.



Turn right at the T-shaped intersection and then right at the second opportunity. Turn right as soon as possible and follow the road through two bends, taking you completely around the WORK icon to the top of the map. Then turn right at the third cross street. Go right at the T-shaped intersection followed by two quick rights. Then turn right at the second opportunity and right at the second opportunity again. The first right after that gets you to work.

To get home from work, follow a similar route shown below.



27. Playing Post Office? Puzzle: p. 25 Hint: p. 123

They are playing Scrabble. They are drawing letter tiles from a bag and playing them into squares (boxes) on the game board. The counter is tallying the scores.

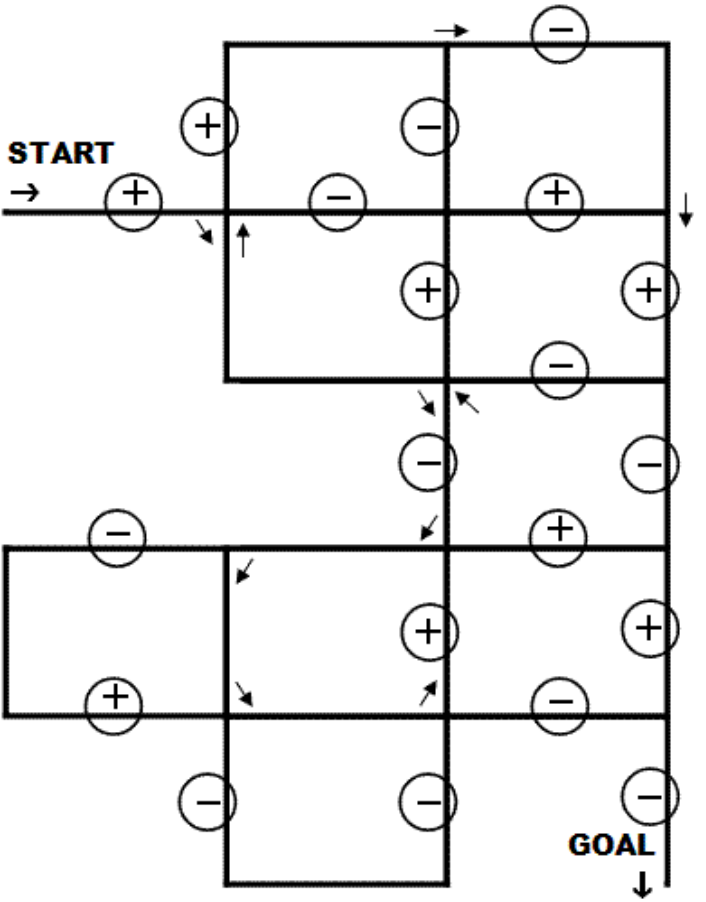
28. Voter Registration Puzzle: p. 25 Hint: p. 123

The only way that 4/9 of the men can be a whole number (integer) is if the total number of men is a multiple of 9. Since the entire population is only 16, the number of men must be 9. Therefore, the number of women is 7 (that is 16 - 9).

29. Alternating Current

Puzzle: p. 26 Hint: p. 123

The way to solve this maze is to get back to the first intersection with a negative charge instead of a positive charge. Then go across the top and down the right side.



30. Murder Mystery 1

Puzzle: p. 27 Hint: p. 123

Clue 3 tells us that the weapon is either the cleaver or the shotgun. This eliminates the poison and the baseball bat in the first two clues. Clue 5 tells us that the murderer is either the Mrs. Ivory or Ms. Bluebird. This eliminates Mr. Kelly in clue 2. The only element left in clue 2 is the den; the room must be the den. This eliminates the bedroom and the foyer in clues 1 and 4. The only element left in clue 1 is Ms. Bluebird; she must be the murderer. Clue 4 now determines the weapon to be the shotgun. So the answer is Mrs. Bluebird in the den with the shotgun.

31. Murder Mystery 2

Puzzle: p. 28 Hint: p. 124

Clues 1, 2, and 5 each name a murderer, a weapon, and a room. Each of these clues also has exactly one element in the correct answer. A little thought should convince you that the nine elements mentioned in these clues must contain the three elements in the correct answer. Write these clues out in a table:

Sgt. Saffron	Telephone cord	Garage
Miss Crimson	Dumbbell	Foyer
Mr. Kelly	Poison	Washroom

Now let's consider the other two clues. Clue 3 eliminates three elements: Prof. Periwinkle, the cleaver, and the washroom. Cross off the washroom in our table. Clue 4 is trickier; the cord, the poison, and the foyer all appear in our table. Let's suppose, for a moment, that the foyer is the correct room. If that is true, then the weapon is not the cord or the poison; only one element of clue 4 is correct. The dumbbell is the only weapon remaining in our table, but it can't be right if the foyer is the room. Both the dumbbell and the foyer are in clue 2, and only one element is in the correct answer. Therefore, the foyer is not the room.

Since we have eliminated the foyer and the washroom, the garage must be the room. That eliminates Sgt. Saffron and the telephone cord. This means that the poison is the weapon (clue 4). So the answer is Miss Crimson with the poison in the garage.

32. Murder Mystery 3

Puzzle: p. 29 Hint: p. 124

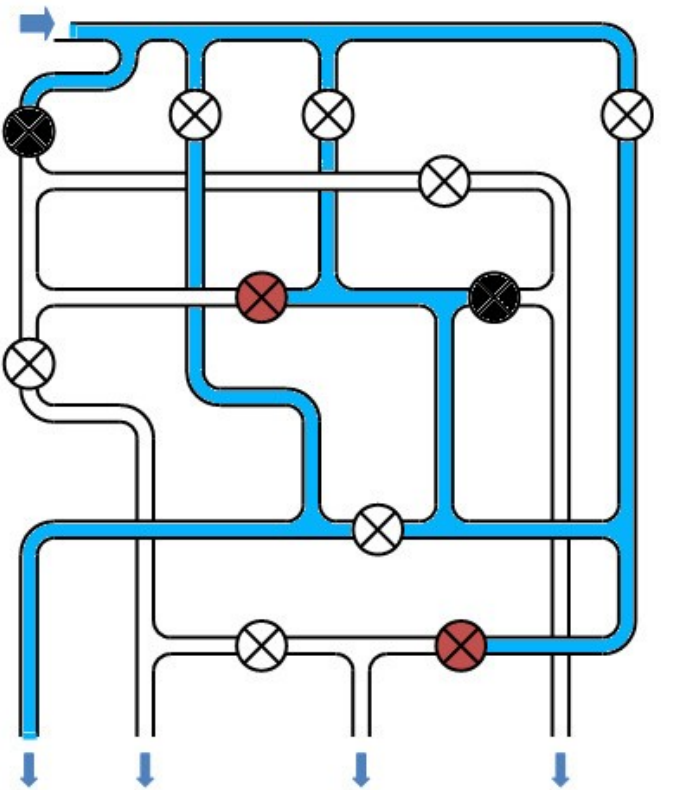
Clues 3, 5, and 6 eliminate all of the rooms except the closet and the den. If the den is the murder location, Prof. Periwinkle and Ms. Bluebird are eliminated (clues 2 and 4). But this creates a problem with clue 1; Ms. Bluebird and the closet are eliminated, but the telephone cord was eliminated in clue 6. Therefore, the room cannot be the den. The room must be the closet.

If the closet is the room, clue 1 eliminates Ms. Bluebird. With Ms. Bluebird and the den eliminated, the shotgun must be the weapon (clue 4). Clue 2 leads us to Prof. Periwinkle as the murderer. Therefore, Prof. Periwinkle did it in the closet with the shotgun.

33. Irrigation

Puzzle: p. 30 Hint: p. 124

Close the valve in the upper left and the valve in the center right.



34. Word Building 3x3

Puzzle: p. 31 Hint: p. 124

Group 1
ANSWERING
BROADSIDE
CITIZENRY
SPAGHETTI
SPEARMINT
THEREFORE

Group 2
ANTIDOTES
COWARDICE
LAMPPOSTS
PSYCHOTIC
TREACHERY
UNEXPOSED

Group 3
ANTIPASTO
COURTYARD
PARACHUTE
PATRIOTIC
PROXIMITY
SPECIALTY

35. Breaking the Sound Barrier

Puzzle: p. 32 Hint: p. 125

Each phrase is an outrageous misspelling of the real phrase:

- Six o'clock news
- Crash a party
- Eight hours' sleep
- Keep your feet on the ground
- In a tight spot
- Film at eleven
- Whistle stop tour
- You have to take the bitter with the sweet

36. Owling at the Sun

Puzzle: p. 33 Hint: p. 125

All of the vowels are O's, and they are already provided. The remaining letters are consonants made up of straight lines only. A palindrome is a word or phrase that is spelled the same forwards and backwards. But in this case the spacing between words is different in the reverse direction. Fourteen straight lines in those six letters means that most of the letters have only two lines. The letters with two lines are L, T, V, and X. V and X are pretty rare. T is the most common consonant, so let's focus on T.

The palindrome means that first and last letters will be the same. In fact, there will be at most three different consonants repeated to make the six letters.

If we put a T as the first letter and form "TOO," our palindrome must end with T. The owl's speech balloon is likely to mention HOOT, so let's try putting the H as the fourth letter. We've used 10 straight lines, so we're back to T for the two middle letters. The sun is beating down and it is just

TOO HOT TO HOOT.

37. So Hard

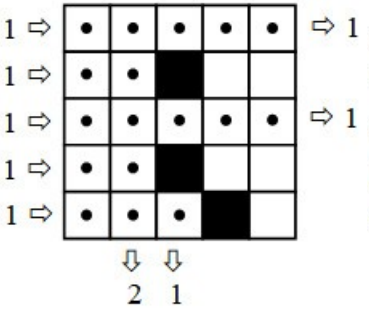
Puzzle: p. 34 Hint: p. 125

Let's identify some key words: cushion, eye, hard to find, resist, punching, clothing, and strands. Think of unusual definitions/usages for the words cushion and eye. Can you relate these words to clothing and strands of thread? What is a famous old adage about something that is very hard to find? There are two more clues hidden in the top line. The title provides a hint with a homophone for the word "sew." The Mojave Desert location is Needles. All of these clues should lead you to a needle (...in a haystack). Reread the riddle and see how everything fits. You remove the needle from the pin cushion and thread it through the eye. Without a thimble you may hurt your hand as you slip it into clothing.

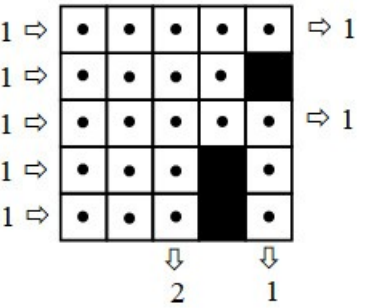
38. O Pachink!

Puzzle: p. 35 Hint: p. 126

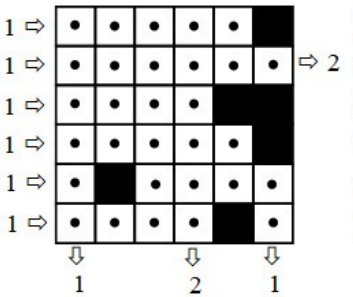
The completed diagrams show empty squares as those with dots.



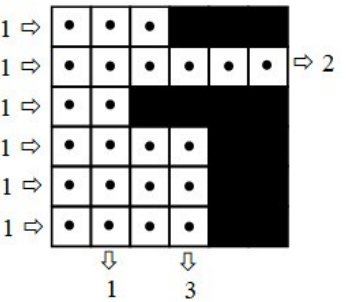
Puzzle 1



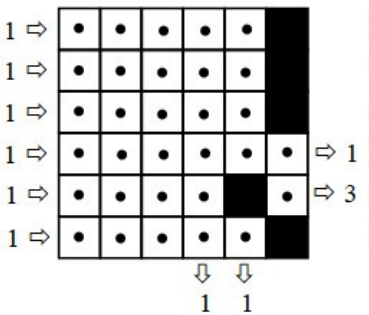
Puzzle 2



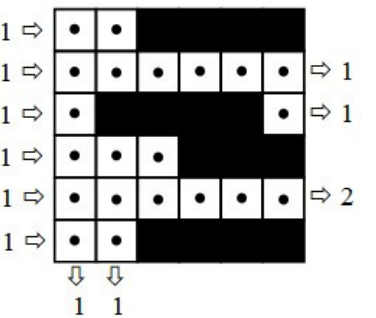
Puzzle 3



Puzzle 4



Puzzle 5



Puzzle 6

There is an alternate solution for Puzzle 4. Can you find it?

39. A Word in Common

Puzzle: p. 38 Hint: p. 126

1. sun, wall, pot, wild, bed, garden = flower
   sunflower, wallflower, flower pot, wild flower, flower bed, flower garden
2. quarter, iron, fly, dark, sense, laugh = horse
   quarter horse, iron horse, horse fly, dark horse, horse sense, horse laugh
3. light, sun, check, bald, blind, weld = spot
   spot light, sun spot, spot check, bald spot, blind spot, spot weld
4. hand, string, chance, split, thought, nature = second
   second hand, second string, second chance, split second, second thought, second nature
5. hand, off, box, water, break, fever = spring
   handspring, offspring, box spring, spring water, spring break, spring fever
6. field, profit, fold, stage, piece, medical = center
   center field, profit center, centerfold, center stage, centerpiece, medical center

40. Head Off to the Rocks

Puzzle: p. 39 Hint: p. 126

Rides	Ides	The center column spells Rock Formation.
Oink	Ink	
Core	Ore	
Kale	Ale	
Fair	Air	
Owed	Wed	
Ruse	Use	
Many	Any	
Again	Gain	
Thorn	Horn	
Ideal	Deal	
Open	Pen	
Near	Ear	

41. Following Orders

Puzzle: p. 40 Hint: p. 127

Q1. YES - The first cross street you passed was MERRY, and we hoped that you would stop looking for the properly spelled roadway, MARY. Three streets later you passed MARY.

Q2. ANITA (partial credit for DIANE) - RI 1 told you to turn right AT (not ONTO) BETTY. The first place you could turn right at BETTY was where BETTY came in from the left and DIANE went off to the right. This gives you the answer ANITA as the first RDWY along JANET. If you noticed that you were **at** BETTY when you came to EMMA, you get partial credit for an answer of DIANE.

Q3. CAROL (the Xth RDWY) - RI 4 told you to turn at the Xth RDWY. Later in the instruction you saw an equation that told you X = 5. We were trying to get you to solve the arithmetic problem and calculate '?' = 4, but the Xth RDWY was the 5th RDWY.

Q4. YES – Read the explanation for Q5 before you read this explanation. Q4 was answerable from the time you completed RI 6 and the time you completed RI 8 because the question was most closely surrounded by RI 6 and RI 8.

Q5. ANITA – RI 6 and RI 7 are listed out of order, but they should have been executed in numerical order. You should have turned right for RI 6 before you turned left for RI 7. You should have reached JANET on HAVEN. ANITA would then be the first RDWY you came to.

42. Lost Silver

Puzzle: p. 42 Hint: p. 127

I lied when I said that "I dropped a bookmark between page 21 and page 22." Printed books have a convention that odd-numbered pages are on the right and that the next higher (even) numbered page is printed on the reverse side. There is no place for me to drop a bookmark between two sides of the same leaf.

Part 3: Answers

43. Mine Cave-In Puzzle1 Puzzle: p. 44 Hint: p. 128

1. Push Block C to the south 3 squares.
2. Push Block G to the north 1 square.
3. Push Block H to the east 1 square.
4. Get the treasure and exit.

44. Mine Cave-In Puzzle 2 Puzzle: p. 44 Hint: p. 128

1. Push Block A to the east 3 squares.
2. Push Block D to the south 1 square.
3. Push Block I to the south 1 square.
4. Push Block H to the west 1 square.
5. Get the treasure and exit.

45. Mine Cave-In Puzzle 3 Puzzle: p. 45 Hint: p. 128

1. Push Block B to the south 1 square.
2. Push Block D to the south 1 square.
3. Push Block C to the west 1 square.
4. Push Block F to the south 2 squares.
5. Push Block H to the east 1 square.
6. Push Block D to the north 1 square.
7. Get the treasure and exit.

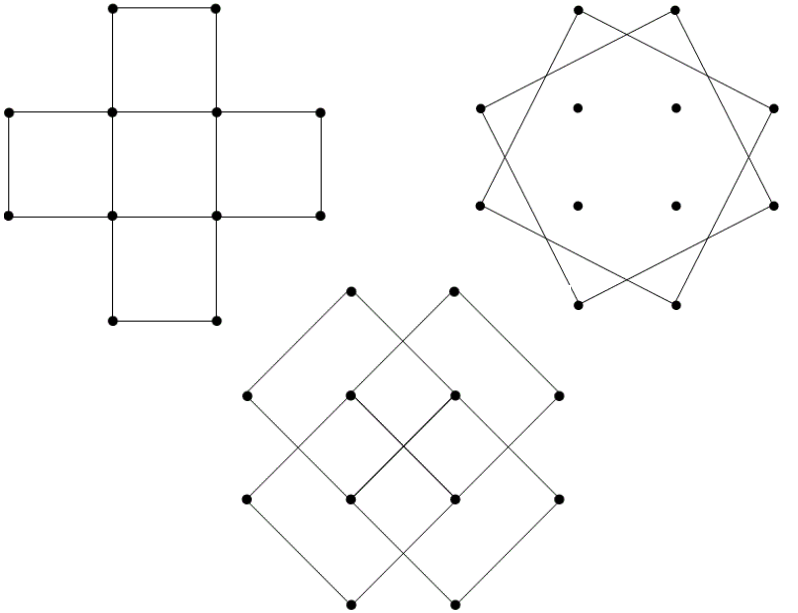
46. Mine Cave-In Puzzle 4 Puzzle: p. 45 Hint: p. 128

1. Push Block C to the south 1 square.
2. Push Block D to the east 1 square.
3. Push Block F to the south 1 square.
4. Push Block C to the west 1 square.
5. Push Block G to the east 1 square.
6. Push Block J to the south 1 square.
7. Push Block I to the south 1 square.
8. Push Block F to the east 1 square.
9. Get the treasure and exit.

47. Square Claims

Puzzle: p. 46 Hint: p. 128

It's fairly easy to see 5 dot squares as shown below. Tilt your head a bit and you'll find 4 more squares that are slightly larger. Then find 2 more large squares at a different angle. There are 11 squares.



48. Hear Here

Puzzle: p. 47 Hint: p. 128

Sound out each message. When pronounced, they are:

1. Danger: Military test range.
2. See the world's tallest thermometer.
3. We love highway drivers in Baker.
4. Have you enjoyed Alien Jerky?
5. Acquiring fuel is essential out here.

49. Time and Space

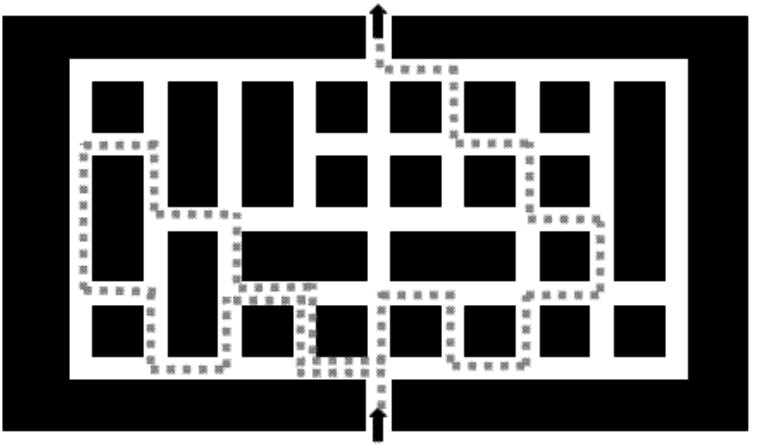
Puzzle: p. 48 Hint: p. 128

Combine 'now' (the present time) and 'here' (the present place), and you get 'nowhere' (a lack of place).

50. Turn, Turn, Turn

Puzzle: p. 49 Hint: p. 129

Here is one possible solution.



51. Mark 10:31

Puzzle: p. 50 Hint: p. 129

If you move the first letter from each word to the end of the word, you will form a new word. The new words are:

idea tea are else there reef elating
earth eighth easel own anchor user caress
exists unblocks hint ought riot

The title refers to the Bible verse 31 in Mark chapter 10. It says that the first shall be last and the last shall be first.

52. State the Headlines

Puzzle: p. 51 Hint: p. 129

The title of the puzzle contains the word STATE. The hint contains the words ADDRESSING, LETTERS, and MAIL. All of the words in the headlines are built from two-letter pieces. They string together United States state abbreviations used for addressing letters and other mail. For example, the abbreviations for Missouri and Mississippi form MOMS.

These are the state abbreviations: AL AK AZ AR CA CO CT DE FL GA HI ID IL IN IA KS KY LA ME MD MA MI MN MS MO MT NE NV NH NJ NM NY NC ND OH OK OR PA RI SC SD TN TX UT VT VA WA WV WI WY

53. Even Three Times

Puzzle: p. 52 Hint: p. 129

Numbers in math problems don't begin with zero; neither A nor C can be 0. If B is zero, then E must also be zero. There is only one zero, so neither of those two letters can be 0. Therefore, D = 0.

The highest possible value for A is 8, so C must be the lowest available digit; C = 2. But that means A can't be as high as 8 because CD would be at least 24. A must be 6. 3 times 6 is 18. B times 3 must be 24 so we can carry the 2 to result in CD = 20.

$$\begin{array}{r} 68 \\ \times\ 3 \\ \hline 204 \end{array}$$

54. Grow from the Middle

Puzzle: p. 53 Hint: p. 129

The first word of the hint was "any." That is pronounced N-E. The answer is "NE" (finest, honest, linear, panels, veneer, and winery).

55. River-Hidden-River

Puzzle: p. 54 Hint: p. 129

Here are the two-letter combinations we intended:

1. "GN" as in magnet
2. "IG" as in aligns
3. "AP" as in staple
4. "RF" as in surfer
5. "YE" as in buyers
6. "UP" as in couple
7. "LV" as in solved
8. "CU" as in secure

56. Shifting Sands

Puzzle: p. 55 Hint: p. 130

To measure 9 minutes: Turn over both timers to begin. After four minutes, reset the 4-minute timer. When the 7-minute timer finishes, restart it. When the 4-minute timer finishes a second time, restart the 7-minute timer (which has used one minute of sand).

Event	Time of Action	7-min Timer	4-min Timer
Start	0	turn over	turn over
4-min timer done	4		turn over
7-min timer done	7	turn over	
4-min timer done; 7-min timer has used one minute	8	turn over	
7-min timer done	9		

To measure 10 minutes: Turn over both timers to begin. After four minutes, reset the 4-minute timer. When the 7-minute timer finishes, restart the 4-minute timer (which has used three minutes of sand).

Event	Time of Action	7-min Timer	4-min Timer
Start	0	turn over	turn over
4-min timer done	4		turn over
7-min timer done; 4-min timer has used 3 minutes	7		turn over
4-min timer done	10		

57. Front-End Loading Puzzle: p. 56 Hint: p. 130

Add DO: dozen, docent, dogear, dosage, and donation.
Add AD: adore, adrift, advisor, adequate, addressed, admission.
Add BE: begun, behalf, beaches, bedroll, bequest.
Add SO: some, solid, solace, sorely, soused.
Add GO: goad, goat, goof, goon, gosling.
Add AS: aspen, assail, asunder, assorted.
Add PI: pinot, pithy, pilots, piracy, pitying, pivoting.

58. Target Ninety-Nine Puzzle: p. 57 Hint: p. 130

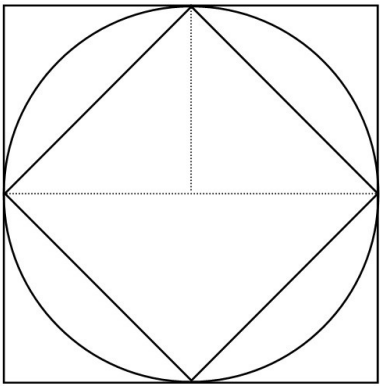
Instead of trying every possible combination of numbers, let's start with a little insight. Notice that all of the target values are odd numbers. If we add two odd numbers, it always results in an even number. Adding four odd numbers gives an even number. Therefore, one of our arrows must hit the non-scoring area or miss the target entirely.

With only three scoring arrows, we'll need to average 33 points per arrow. This implies that at least one arrow will need to hit 43 or 37 (the only values higher than 33). If we hit 43 twice, we'll need 13 more points to get 99. But there is no way to get 13. If we hit a 43 and a 37, we'll need 19 more points. Again, there is no way to get 19. If we hit 37 twice, we'll need 25. At last! There is a 25 score available. So the answer is 37-37-25-0. A few more calculations should convince you there are no other valid answers.

59. Crop Circle/Squares

Puzzle: p. 58 Hint: p. 131

If we rotate the inner square 45 degrees (so that it touches the outer square), we see that the difference between the areas of the two squares is equal to four triangles (the four corners of the outer square). It is also easy to see that the area of each triangle is equal to a matching triangle inside the smaller square. Therefore, the area of the smaller square is 50 (half of the outer square's 100).



60. Four Card Logic

Puzzle: p. 58 Hint: p. 131

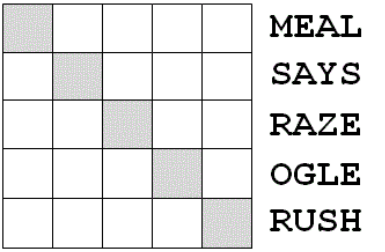
Item 4 implies that there are two face cards and two number cards. There are no aces (item 2), so face cards must be in the highest ranking positions (3 and 4). Item 5 tells us that one number card is four higher than the other. Item 2 tells us that one number card is a five. The number cards can only be five and nine, because there are no aces (see item 2).

We have a five, a nine, and two face cards. The nine and the lower face card are both diamonds (item 3). The red five must be a heart. The fourth card must be the club and it must be a king (higher than a queen). Therefore, the cards are a five of hearts, a nine of diamonds, a queen of diamonds, and a king of clubs.

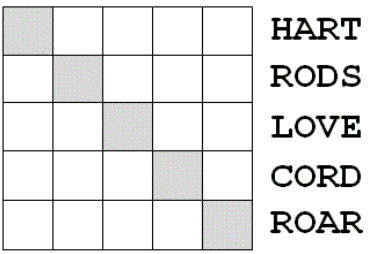
61. Anagram Quints

Puzzle: p. 59 Hint: p. 131

We added the letter "B" and got these words:
BLAME,
ABYSS,
ZEBRA,
GLOBE, and SHRUB.



We added the letter "W" and got these words:
WRATH,
SWORD,
VOWEL,
CROWD, and
ARROW.



62. Boxed Rebus Puzzles 1

Puzzle: p. 60 Hint: p. 131

Sails + tacks = Sales Tax
Four Petes + Ache = For Pete's Sake
Apple + Love + my + I = Apple of my eye
All + Dressed (UP) + nowhere (TO GO) = All dressed up and nowhere to go
A squared + Ants = A square dance
Letter + per + fect = Letter perfect

63. Boxed Rebus Puzzles 2

Puzzle: p. 61 Hint: p. 131

Bed + Dove + Roses = Bed of roses
b + Link + Oven + I = Blink of an eye
(Last) Ditch + F + Fort = Last ditch effort
Draw + Pin + the + Bucket = Drop in the bucket
I'm (ON) Cloud (9) = I'm on cloud 9
Leaf + Nose + Toe + Nun + Turn + d = Leave no stone unturned

64. Rebus Category 1

Puzzle: p. 62 Hint: p. 132

b + Ache + Doll + Lass + Caw = Baked Alaska
Pineapple + (UPSIDEDOWN) Cake = Pineapple upside down cake
c (IN) nam (ON) + Roll = Cinnamon roll
Banana (SPLIT) = Banana split
Apple (TURN OVER) = Apple turnover
Straw + Bury + (SHORT) cake = Strawberry shortcake
Chair + E + cob (BLUR) = cherry Cobbler
Eye (SCREAMS) + And + Witch = Ice Cream sandwich
The category is desserts.

65. Rebus Category 2

Puzzle: p. 63 Hint: p. 132

Whip + Oar + Will = Whippoorwill
Pair + Rack + Eat = Parakeet
J = Jay
King + Fish + R = Kingfisher
Crane = Crane
Yell + O + Bell + Lead + Sap + Sucker = Yellow-bellied sapsucker
s + And + Pi + Per = Sandpiper
Ten + S + E + war (BLUR) = Tennessee warbler
The category is birds.

66. Rebus Category 3

Puzzle: p. 64 Hint: p. 132

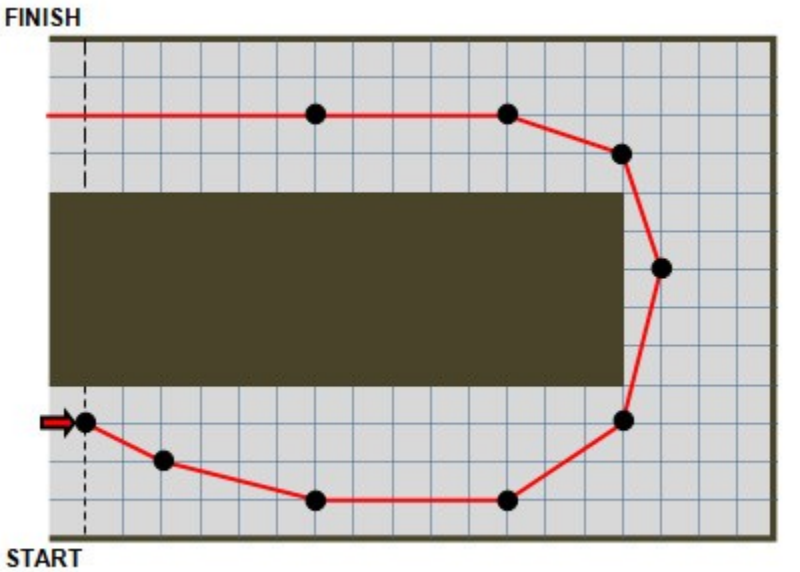
Kneel + Diamond = Neil Diamond
Will + Lean + L + Sun = Willie Nelson
Palm + Mug + Cart + Knee = Paul McCartney
N + Gull + Bird + Hump + Bird + Ink = Engelbert Humperdinck
Bill + Leech + Hole = Billy Joel
L + Ton + John = Elton John
The category is male vocalists.

67. Speedway

Puzzle: p. 65 Hint: p. 132

Getting up to speed = 6 on the eastward straightaway would have our car crashing into the far wall. Staying at speed = 4 on the third and fourth moves will send our car one square too far east, requiring an extra move as we switch directions. Going two squares south before the turn allows us to build northward speed and complete the turn faster.

Move #	Change in Speed				Speed			
1	East	+2	South	+1	East	2	South	1
2	East	+2	South	0	East	4	South	1
3	East	+1	North	+1	East	5	South	0
4	West	+2	North	+2	East	3	North	2
5	West	+2	North	+2	East	1	North	4
6	West	+2	South	+1	West	1	North	3
7	West	+2	South	+2	West	3	North	1
8	West	+2	South	+1	West	5	North	0
9	West	+2	South	0	West	7	North	0



68. Primer Subject

Puzzle: p. 66 Hint: p. 132

Each word is a homograph that has two different pronunciations and meanings:

desert (arid region, abandon)
does (present tense of to do, female deer)
dove (past tense of to dive, white bird)
entrance (a way into something, to cast a spell on)
invalid (not legitimate, injured or sickly person)
minute (60 seconds, very small)
refuse (deny, trash)
sow (plant seeds, female pig)
wound (past tense of to wind, lesion)

69. Crash Course

Puzzle: p. 66 Hint: p. 132

Jeff seems to be in control of his vehicle. He's not just a passenger. But the story never says that any of the vehicles are cars, and it never says that the bird lands on the road in front of him. One way to explain the situation is that Jeff is flying in formation with two other planes (maybe barnstorming at a local air show). A bird flies into his flight path on a collision course. Jeff has two directions that the driver of a car doesn't have: up and down. If he drops his plane into a quick dive or climbs out of his current path, he could avoid the bird. As usual, give yourself full credit for any reasonable answer.

70. Prickly Pairs

Puzzle: p. 67 Hint: p. 133

There may have been several ways to group the 12 words into pairs, but we were looking to associate words into these two-word phrases: ice age, cell phone, for sale, rain dance, sea spray, and use tax.

That same logic won't exactly work for the second set of words. But you can form homophones (sound-alikes) of the six pairs in the first list: eye sage, self own, force ail, reigned ants, cease prey, and you stacks.

71. Equation

Puzzle: p. 68 Hint: p. 133

Find two different integers (x and y) where x times y = x minus y. Since the numbers must be different, we can't set both equal to zero. If both numbers are positive integers (like 1 and 2), the product will always be greater than the difference. If there is an answer, we'll have to use negative numbers. The solution is x = –2 and y = 2.

72. Sequence 24

Puzzle: p. 68 Hint: p. 133

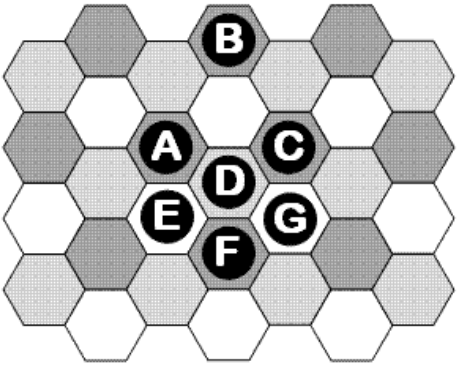
Each entry represents part of a word. The first letter of each word has been removed, and some of the final letters have also been removed. The seven words represent a very common repeating sequence. Each three-letter entry represents the second through fourth letters of a day of the week. Therefore, the next entry should be UND (for sUNDay). Then the cycle repeats.

Part 4: Answers

73. Hex Checkers Puzzle: p. 69 Hint: p. 134

Move 1: B steps up (to the center cell on the top row).
Move 2: F jumps E, A, D, G, and C.
Move 3: B jumps F.

Any of the six outside pieces could make a step out from the center for the first move. So there are 6 good starting moves and 6 different jumping sequences that will work for each starting move. That makes 36 correct answers.



74. Summer Squares 100 Puzzle: p. 71 Hint: p. 134

1. Express 100 as the sum of the squares of two different integers. $100 = 6^2 + 8^2$ or $100 = 0^2 + 10^2$
2. Now express 100 as the sum of the squares of five different integers. $100 = 1^2 + 3^2 + 4^2 + 5^2 + 7^2$

The hint said "if you're not positive...." This was meant to suggest that you use zero or negative integers.

3. Express 100 as the sum of the squares of three different integers. $100 = 0^2 + 6^2 + 8^2$
4. Finally, express 100 as the sum of the squares of four different integers.
   $100 = 1^2 + (-3)^2 + 3^2 + 9^2$ or $100 = 1^2 + (-5)^2 + 5^2 + 7^2$
   or $100 = 2^2 + (-4)^2 + 4^2 + 8^2$

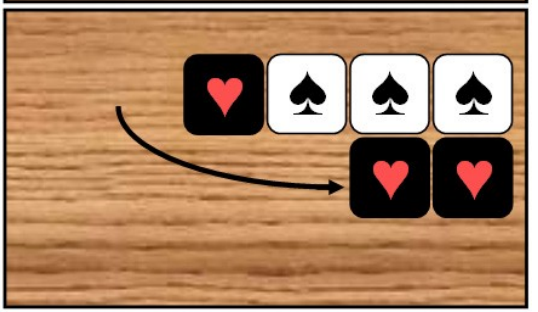
Other answers are possible.

75. Coaster Challenge

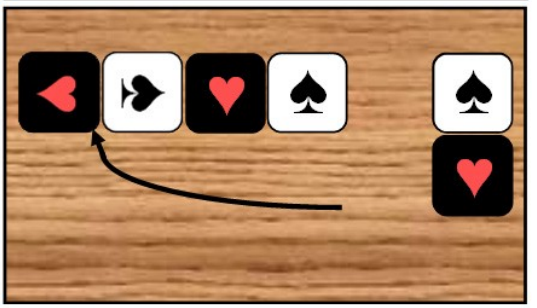
Puzzle: p. 72 Hint: p. 134

START

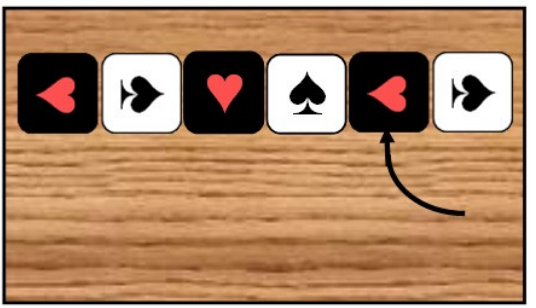
MOVE 1



MOVE 2



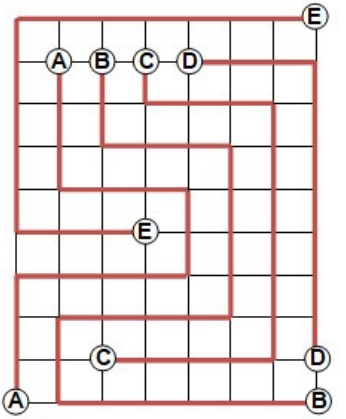
MOVE 3



76. Circuit Board

Puzzle: p. 73 Hint: p. 134

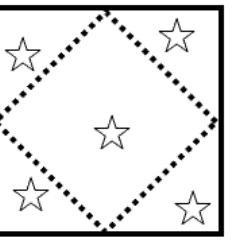
The E-to-E connection goes along the top and down the left side. Then the lines for A, B, C, and D snake around E.



77. Five Little Pigs

Puzzle: p. 74 Hint: p. 134

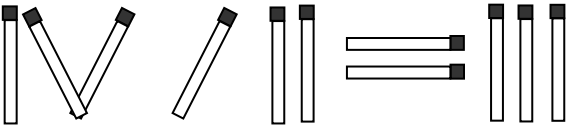
The five enclosed areas don't have to be the same size; they only need to be separate. Place the new square diagonally inside the larger square. The result is four triangular areas and one square area. Each pig (represented by a star) has its own private enclosure.

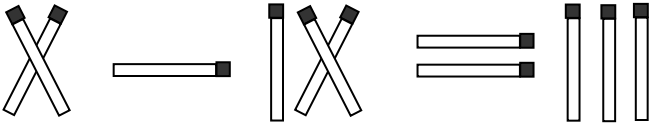


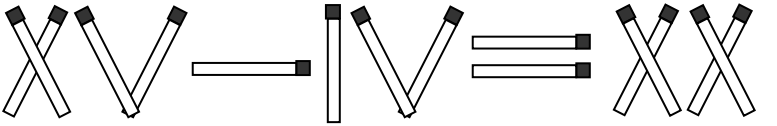
78. Matchstick Math – Roman

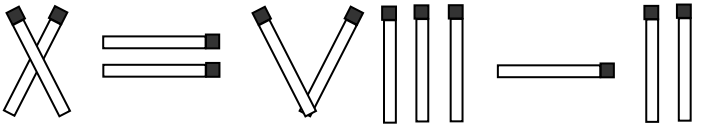
Puzzle: p. 74 Hint: p. 135

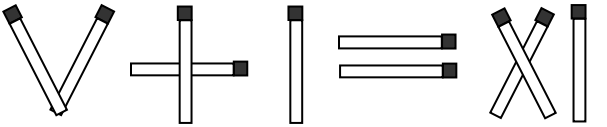
1. IV / II = III → VI / II = III; "I" is moved from "IV" to "VI"
2. X – IX = III → XI – IX = II; "I" to other side of equals sign
3. XV – IV = XX → XV + V = XX; "I" across "–" to form "+"
4. X = VIII – II → X – VIII = II; move top of "=" over the "–"
5. V + I = XI → X + I = XI; move diagonal to change "V" to "X"
6. X – II = V → X / II = V; rotate "–" to form "/"
7. IX × V = I → X × V = L; put "I" at base of "I" to form "L"
8. VI = II – I → I / I = II – I; separate and rotate the left side of the "V" to form an "I"; the remainder of the "V" is now "/".
9. X / II = II → I × II = II; move the division sign ("/") to the left and make it an "I"; then look at "X" as "×" instead of "10".

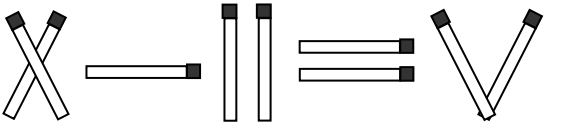
1. 

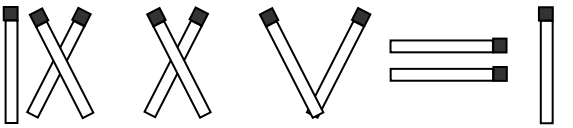
2. 

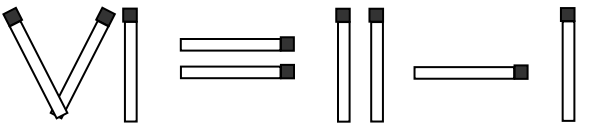
3. 

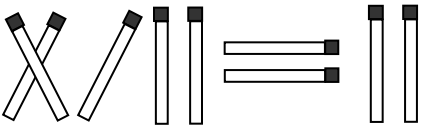
4. 

5. 

6. 

7. 

8. 

9. 

79. Fill Two Blanks Twice

Puzzle: p. 76 Hint: p. 135

Here are the solutions we found. If you found other answers, you probably have a bigger vocabulary.

1. column, volume
2. fleece, freeze
3. phrase, thrash
4. nephew, nether
5. submit, sunlit
6. refuel, sequel
7. bayous, joyous
8. jinxed, junked
9. grouch, growth
10. suntan, syntax
11. enlist, insist
12. safari, salami
13. beauty, deputy
14. grovel, trowel

    (propel repeats the letter 'p')

15. bedpan, bemoan
16. errata, ersatz
17. rescue, risque
18. sorbet, street
19. undoes, unions
20. blares, boards

    (beards repeats letters in blares or boards)

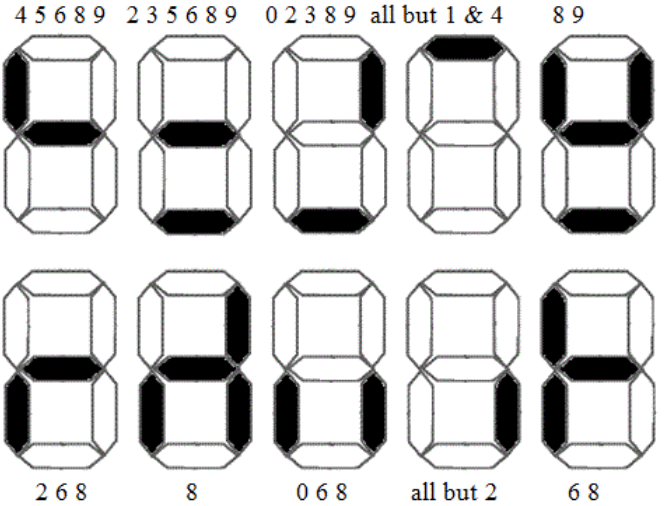
80. Faulty Calculator

Puzzle: p. 77 Hint: p. 135

There are two basic approaches we can use:

1. Pick a number and see which displays could match it, or
2. Pick a display and see which numbers it could match.

Let's apply the second approach to all the displays and then begin a process of elimination.



We see that one of them can only be an 8. Because we've eliminated the 8, we can identify two others. The last display on the top row is 9, and the last one on the bottom row is 6. Now we can identify two more. The first display on the bottom row must be 2; the third display on the bottom row must be 0.

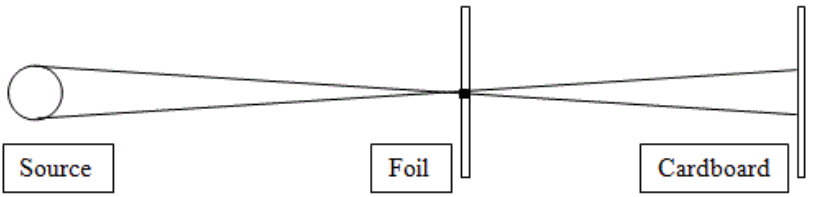
If we apply the first approach, we see that only the fourth display on the bottom row can be the number 1. Knowing this, the digit above the 1 must be a 7 and the first display on the top row must be 4. Of the two remaining displays, the second display on the top row must be 5 and the third display must be 3. The answer is 4, 5, 3, 7, 9, 2, 8, 0, 1, and 6.

81. Eclipse Image

Puzzle: p. 78 Hint: p. 136

a. 1:30 b. 4:30 c. 7:30 d. 10:30

A pin hole 'lens' inverts an image right-to-left and top-to-bottom. The light from the lower half of the sun is projected at the top of the image on the cardboard. The light from the left side of the sun is projected at the opposite side of the cardboard.



What really makes this tricky is that you are viewing the image on the cardboard from the opposite direction from how you would view the sun directly. If you saw the image from the back side of the cardboard (if it were a piece of ground glass, for example), the image would be completely reversed. The bite would appear to be at 10:30 in that case.

But you are looking at a sort of shadow from the other side of the cardboard, so the image is a mirror image that reverses right and left. Therefore, the shadow image that you see on the cardboard has a bite out of the 1:30 position. Top and bottom have been inverted, but left and right are not.

The answer is (a) 1:30.

This conclusion is verified by actual photographs taken during a recent eclipse.

82. Mined Blocks 1

Puzzle: p. 81 Hint: p. 136

1. Push Block E one square to the west.
2. Push Block D one square to the south!!
3. Push Block C one square to the west.
4. Push Block E two squares to the south.
5. Push Block C two squares to the north.
6. Push Block A one square to the west.
7. Push Block A three squares to the south.
8. Push Block F one square to the south.
9. Push Block H one square to the east!!
10. Push Block E one square to the north.
11. Push Block G one square to the south.
12. Get the treasure and go to the exit.

83. Mined Blocks 2

Puzzle: p. 82 Hint: p. 136

1. Push Block B one square to the south.
2. Push Block A one square to the west.
3. Push Block A three squares to the south.
4. Push Block D two squares to the north!!
5. Push Block G one square to the east.
6. Push Block B one square to the south!!
7. Push Block C one square to the east.
8. Push Block E one square to the south.
9. Push Block F one square to the east.
10. Push Block C one square to the north.
11. Push Block F two squares to the south.
12. Get the treasure and go to the exit.

84. Mined Blocks 3

Puzzle: p. 83 Hint: p. 136

1. Push Block B one square to the south.
2. Push Block B one square to the west.
3. Push Block F two squares to the east.
4. Push Block E two squares to the south.
5. Push Block F two squares to the west!!
6. Push Block C one square to the west.
7. Get the treasure.
8. Push Block H one square to the west.
9. Push Block J one square to the east.
10. Push Block I one square to the west.

11. Push Block I one square to the east!!
12. Push Block D two squares to the north.
13. Push Block B one square to the south.
14. Go to the exit.

85. Mined Blocks 4

Puzzle: p. 84 Hint: p. 136

1. Push Block C two squares to the east.
2. Push Block C four squares to the south!!
3. Push Block H one square to the south.
4. Push Block I one square to the west!!
5. Push Block K one square to the south.
6. Push Block H one square to the west.
7. Push Block F one square to the north.
8. Push Block E one square to the north.
9. Push Block B one square to the west.
10. Get the treasure and go to the exit.

86. Mined Blocks 5

Puzzle: p. 85 Hint: p. 137

1. Push Block A two squares to the west.
2. Push Block E one square to the west.
3. Push Block C one square to the north!!
4. Push Block B one square to the west.
5. Push Block E two squares to the south.
6. Push Block L one square to the east.
7. Push Block E one square to the south!!
8. Push Block J one square to the east.
9. Push Block H one square to the east.
10. Push Block F two squares to the north.
11. Push Block I one square to the south.
12. Push Block H one square to the west.
13. Push Block K two squares to the south.
14. Push Block M one square to the west.
15. Get the treasure.
16. Push Block L two squares to the north.
17. Go to the exit.

87. Perfect Square Combos

Puzzle: p. 86 Hint: p. 137

The answer I was looking for repeats some of the numbers. I chose 1, 8, 8, and 8.

$1 + 8 = 9 = 3^2$
$8 + 8 = 16 = 4^2$
$1 + 8 + 8 + 8 = 25 = 5^2$

Incidentally, the story about borax mentions the year 1888, which contains the answer to the puzzle.

88. Who Am I?

Puzzle: p. 86 Hint: p. 137

David is a newborn baby.

89. pHoneyMoons

Puzzle: p. 87 Hint: p. 137

Crescent moon: The position of the stars is the problem. The star inside the arc of the crescent moon would never be visible. The moon is actually a full circle; it only appears to be a sliver because most of the moon is in shadow. The star can't be in front of the moon.

Half moon: A half moon can't have its dark half angled down toward the horizon. That would mean that the sun is high in the sky, which would never happen at night. A full moon halfway into an eclipse might have its dark side near the horizon, but the shadow would be curved like it is in the shooting star picture.

Shooting star: A shooting star (meteor) is caused by an object burning up in the earth's atmosphere. This phenomenon is much closer than the moon. It would never appear to be going behind the moon.

Big Dipper: There are two reasons why this couldn't happen; both require some knowledge of the Big Dipper constellation. First, the moon is drawn much too large compared with the constellation of stars. Second, the moon would never appear that far north. The moon and planets move in a range (called 'the ecliptic') near the celestial equator. The Big Dipper is much farther north, near the North Star.

Venus near the full moon: Venus is always a morning star or an evening star. It stays close to the sun. The full moon is always as far from the sun as possible (relative to an earthly observer). Venus will never appear near the full moon.

90. Gallery

Puzzle: p. 88 Hint: p. 137

Here is the full explanation of the answer. Theatrical artists draw a crowd. Crowds are, at times, unlawful. Crowds are composed of people. Artistic types (performers) get a hand (applause) from a crowd. Crowds are temporary, where people sit or stand. A party's host can assemble a crowd. A host is another word for crowd. A crowd cannot be created in solitude. A gallery (as at a golf tournament) is a crowd of people. So, crowd is the answer.

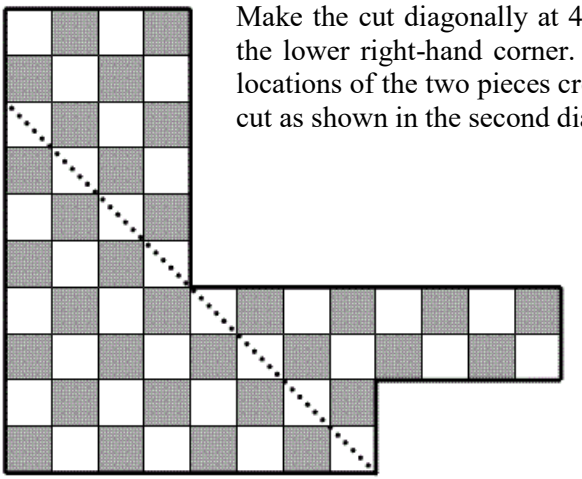
91. Pay Me

Puzzle: p. 88 Hint: p. 138

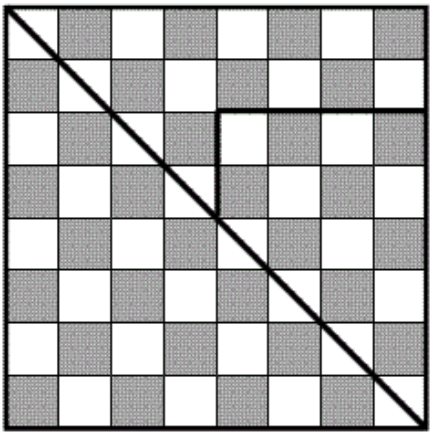
OK, the verse sounds like it's written by Yoda, but can you work out the riddle? The answer is synonymous with care, tending, consideration, notice, concentration, and (to) mind. It can be dangerous when you don't pay _____. Men stand up straight when people say _____. I'm about to tell you the answer, so pay attention. That's it. Attention is the answer.

92. One-Cut Checkerboard

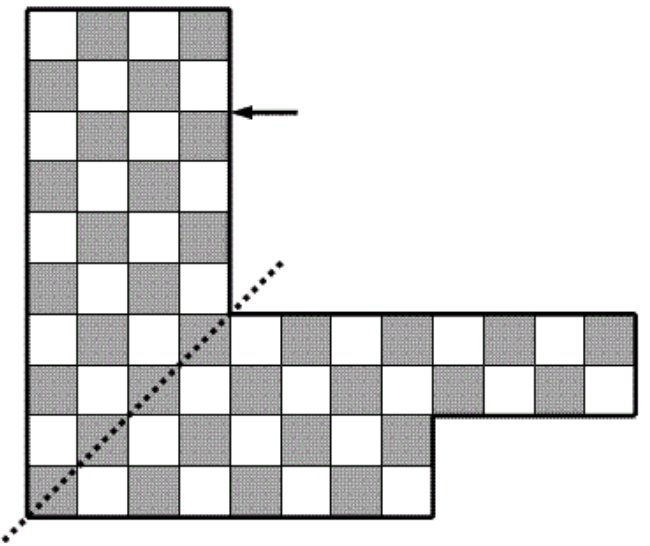
Puzzle: p. 89 Hint: p. 138



Make the cut diagonally at 45 degrees from the lower right-hand corner. Then swap the locations of the two pieces created above the cut as shown in the second diagram.



Point of interest: If the starting piece is made of paper instead of wood, there is another solution. Fold the paper along the dotted line shown below. Then make a single cut at the arrow. The single cut creates both of the 2x4 rectangles that we needed two cuts to make in the puzzle's example.



93. What Goes Around

Puzzle: p. 90 Hint: p. 138

geodes (spherical rocks with crystals inside)
globes (or gloves)
gnomes
gooses (verb form of to goose)
groves (or gropes)

94. Short i, as in Fit

Puzzle: p. 90 Hint: p. 138

Many answers are possible, but here are a few:

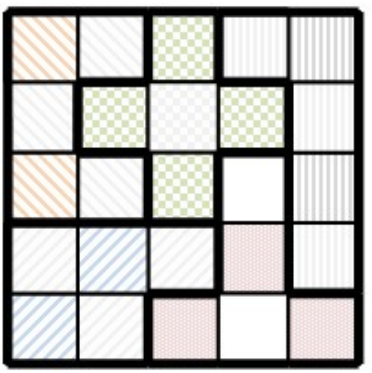
a = private, desolate, pillage
e = pretty, been, poet
o = women
u = busy, minute
y = gym, crypt, hymn

Pretty women in busy, private gym

95. Pentomino Checkerboard

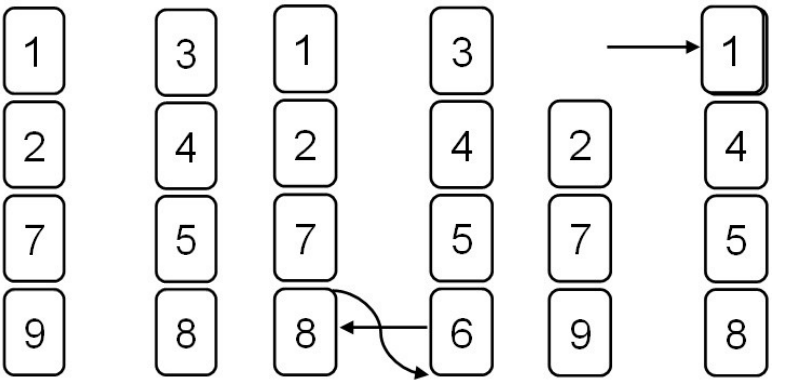
Puzzle: p. 91 Hint: p. 139

The hint explains why you'll need to use the X and the T and that all four corner squares will be black. Now let's finish the puzzle. The X will only fit the pattern if you place it up against the middle of one of the edges; the edges are symmetrical, so it doesn't matter which one. You will need two hook-shaped pieces to wrap around the X and fill the corners. The only two pieces that match that description are the C and the L. Place the T upside down in the lower right corner. The remaining space conveniently holds the B piece.



96. Some Totals

Puzzle: p. 92 Hint: p. 140



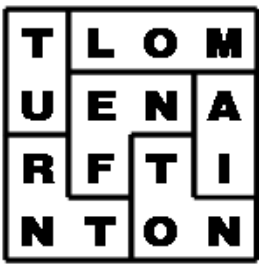
Puzzle Classic Answer Minimum Answer

The classic answer turns the "9" upside down to make it a "6", then swaps the positions of the "6" and the "8". Another answer places the "1" card on top of the "3".

97. Jigsaw Message 1

Puzzle: p. 93 Hint: p. 140

The evil twist to this puzzle is that the message reads downward instead of straight across the page. All you need to do to reveal the message is to switch the pieces that have the same shapes. The vertical rectangles "TU" and "AI" change places, and the L-shaped pieces change places. The resulting message tells you to make a left turn onto Main Street.



98. Jigsaw Message 2

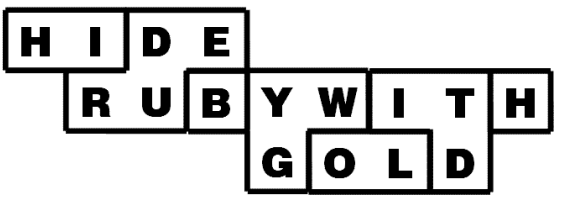
Puzzle: p. 93 Hint: p. 140

This puzzle has two evil twists. Two linear pieces need to be rotated before you reassemble the square. The shorter piece ("OO") is turned 90 degrees. The longer piece ("SNI") is turned upside-down to become "INS." The "L" moves to the upper left-hand corner. The "K" goes to the upper right-hand corner. The "OO" takes the center of the top line. The other pieces fit together and tell us to look into coal bins.

99. Jigsaw Message 3

Puzzle: p. 93 Hint: p. 140

English doesn't have a common four-letter word that contains "YW." It certainly doesn't have one that can be formed with the pieces given. Instead, let the "Y" be the last letter of one word and "W" be the first letter of another. This means the solution won't be a square. We try several words starting with "W", but only 'with' seems to work. The word below 'with' has the pattern G _ _ D, and 'gold' fits nicely. By turning the "IH" upside-down and combining it with "DE" we get 'hide'. That leaves 'ruby' as the second word. Our instructions tell us to hide the ruby with the gold. We have a 'shape' outside the 'box'.



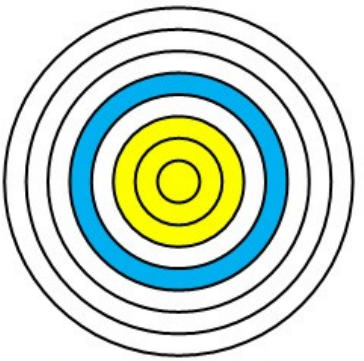
100. Equal Areas

Puzzle: p. 94 Hint: p. 140

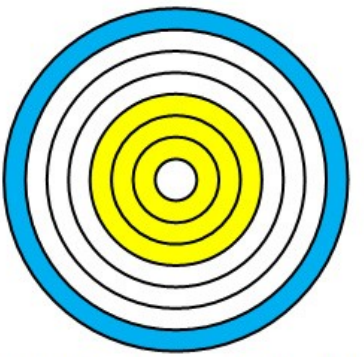
The area of each circle is pi times the radius squared ($A = \pi r^2$). The area of each annulus is the area of the outer circle minus the excluded inner circle's area. We'll ignore pi because every region's area is a multiple of pi, and we're only interested in comparing areas. The areas of each circle and annulus are shown in the following table:

r	r^2	r^2-1	r^2-4	r^2-9	r^2-16	r^2-25	r^2-36	r^2-49
1	1							
2	4	3						
3	9	8	5					
4	16	15	12	7				
5	25	24	21	16	9			
6	36	35	32	27	20	11		
7	49	48	45	40	33	24	13	
8	64	63	60	55	48	39	28	15

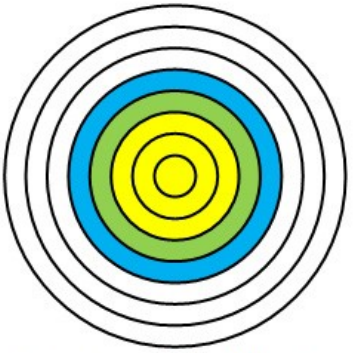
The answers are illustrated below:



25-16=9 & 3^2=9

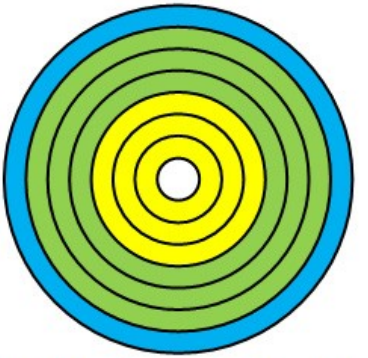


64-49=15 & 16-1=15



25-9=16 & 4^2=16

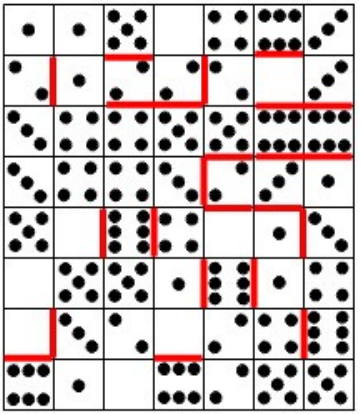
49-25=24 & 25-1=24



64-16=48 & 49-1=48

101. Domino Mosaic

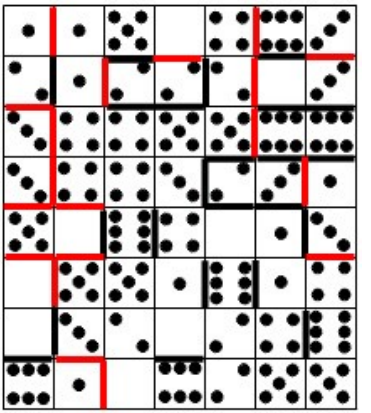
Puzzle: p. 95 Hint: p. 141

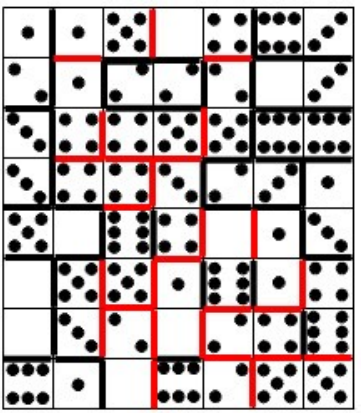


Step 1: Draw boundary lines between adjacent squares that don't match the orientations of the tiles in the boneyard. For example, sixes only connect to squares at the top or bottom, not at their sides. A two or a three above a blank or a one must lean to the left. The first diagram shows these boundaries.

Step 2: Draw boundary lines where squares are paired into tiles. For example, the double six, double blank, six-one, three-two, and three-one.

Step 3: Draw boundaries around tiles where only one possible location exists. For example, six-three, three-blank, double three, and two-one.





Step 4: Repeat steps 2 and 3 now that some tiles have been removed from the boneyard. For example, the three-two is taken, so the three in the lower left must belong with the five. The five-blank is taken, so the five and the blank at the top must be separated. That causes the double one tile to be in the lower right. This yields the final solution.

102. Domino Jigsaw 1

Puzzle: p. 96 Hint: p. 141

We'll use steps 1 - 3 explained in the hint.

Step 1:	2-2	4-4	2-5	5-5	
Step 2:	0-3	0-4	1-6	0-2	
Step 3:	Split 0-3 on the third and fifth rows Split 0-4 on the second column Split 1-6 on the first and sixth columns Split 0-2 on the second and third columns and on the sixth row				

The grid now looks like this:

0	4	4	2	1	6	4
3	2	1	0	5	5	0
2	6	5	0	3	6	2
5	4	1	5	1	1	2
3	0	0	6	5	6	4
1	2	0	6	0	6	3
6	4	2	3	1	3	3
4	5	3	2	1	4	5

Adding the separators in step 3 gives us more chances to use step 2.

Step 2:	1-3	2-4	4-6	3-5	2-3
	1-2	0-0	0-6	3-6	1-1
Step 3:	Split 1-3 on the seventh row Split 4-6 on the second column and fifth row Split 3-5 on the seventh column Split 1-2 on the second row				

Our grid now looks like this:

0	4	4	2	1	6	4
3	2	1	0	5	5	0
2	6	5	0	3	6	2
5	4	1	5	1	1	2
3	0	0	6	5	6	4
1	2	0	6	0	6	3
6	4	2	3	1	3	3
4	5	3	2	1	4	5

We now have enough information to finish the puzzle using step 2. Tiles 2-6, 1-5, 1-4, 0-5, and 5-6 fall into place. We also find 0-1, 6-6, 4-3, 3-3, and 4-5.

0	4	4	2	1	6	4
3	2	1	0	5	5	0
2	6	5	0	3	6	2
5	4	1	5	1	1	2
3	0	0	6	5	6	4
1	2	0	6	0	6	3
6	4	2	3	1	3	3
4	5	3	2	1	4	5

103. Domino Jigsaw 2

Puzzle: p. 97 Hint: p. 141

We'll use steps 1 - 3 explained previously.

Step 1:	0-0	1-1	2-2	3-3	4-4
	5-5				
Step 2:	0-3	3-5			

The grid now looks like this:

4	2	6	3	5	1	0
6	1	5	0	0	1	3
6	4	0	1	4	5	6
0	2	5	5	3	2	1
2	0	4	3	1	3	4
2	4	2	6	3	2	4
4	5	3	5	3	0	1
1	6	6	0	5	6	2

Let's go back and apply steps 1 and 2 again.

Step 1:	1-5	2-5	1-2		
Step 2:	2-6	4-6	1-6		
Step 1:	6-6	0-1	1-4	3-6	4-5

Our grid now looks like this:

4	2	6	3	5	1	0
6	1	5	0	0	1	3
6	4	0	1	4	5	6
0	2	5	5	3	2	1
2	0	4	3	1	3	4
2	4	2	6	3	2	4
4	5	3	5	3	0	1
1	6	6	0	5	6	2

We can now finish the puzzle by applying steps 2 and 1 again.

Step 2:	3-4	1-3	0-2	5-6	0-5
	2-3	0-4			
Step 1:	2-4	0-6			

4	2	6	3	5	1	0
6	1	5	0	0	1	3
6	4	0	1	4	5	6
0	2	5	5	3	2	1
2	0	4	3	1	3	4
2	4	2	6	3	2	4
4	5	3	5	3	0	1
1	6	6	0	5	6	2

104. Domino Jigsaw 3

Puzzle: p. 97 Hint: p. 141

We'll use steps 1 - 3 explained previously.

Step 1:	1-1	3-3	3-5		
Step 2:	3-4				
Step 3:	Split 3-4 on the fourth row				
Step 1:	3-6	2-3			
Step 2:	0-5	2-6			

The grid now looks like this:

2	3	0	5	4	1	3
2	1	1	5	6	4	0
6	3	3	1	2	6	3
6	0	4	3	1	2	2
1	0	4	0	4	5	6
2	6	4	2	0	5	6
0	1	5	4	0	6	3
5	5	2	1	3	5	4

Let's go back and apply steps 3 and 2 again.

Step 3:	Split 0-5 on the sixth row and first column Split 2-6 on the sixth row; columns 5 and 7				
Step 2:	5-5	1-5*	1-2	2-2	0-3

* - The six numbers in the upper right corner must be three tiles; the 5 on the second row goes with the 1 below it.

Step 3:	Split 5-5 on the sixth column Split 1-5 on the seventh row Split 1-2 on the first column and eighth row Split 0-3 on the seventh column

Our grid now looks like this:

2	3	0	5	4	1	3
2	1	1	5	6	4	0
6	3	3	1	2	6	3
6	0	4	3	1	2	2
1	0	4	0	4	5	6
2	6	4	2	0	5	6
0	1	5	4	0	6	3
5	5	2	1	3	5	4

We can now finish the puzzle by applying steps 2 and 1 again.

Step 2:	1-3	4-6	0-4	0-2	1-6
	2-5	1-4			
Step 1:	0-1	0-0	0-6	4-4	2-4
	4-5	5-6	6-6		

The completed grid looks like this:

2	3	0	5	4	1	3
2	1	1	5	6	4	0
6	3	3	1	2	6	3
6	0	4	3	1	2	2
1	0	4	0	4	5	6
2	6	4	2	0	5	6
0	1	5	4	0	6	3
5	5	2	1	3	5	4

Part 5: Answers

105. UFOs

Puzzle: p. 100 Hint: p. 142

Here are my explanations for the weird sightings:

1. Always be suspicious when you don't notice UFOs until after the fact (when you watch the video). You should suspect a camera problem. In this case a moth or other insect was making a tight circle in the lantern light. After hovering slightly above our heads, it dashed out of view of the camera. Because we mistook this light object for a large craft at a significant distance, it seemed that the object was moving at tremendous speed.

2. The region where the desert meets the San Gabriel Mountains is a breeding ground for lenticular clouds. These saucer-shaped clouds are formed by the circular air currents (eddies) near the mountains. The clouds often look like a giant, floating stack of pancakes but sometimes resemble a single flat disk. They are often mistaken for huge UFOs.

3. Just before New Year's Day in Pasadena there are huge crowds of people assembled for the parade and for the Rose Bowl game. Advertisers hire the Goodyear blimp to display their messages in scrolling lights like those in Times Square. I was directly below the low-flying blimp. I saw the scrolling light messages as a ring turning slowly in a clockwise oval. It was too quiet for a helicopter or plane.

4. The light I saw was the headlight of a commercial jet heading west in its approach to Burbank Airport. It split in two because a second plane was just behind it. Neither jet was close enough yet to see its red and green wing lights or to hear its engines. Zooming in with cell phone video at night resulted in the image being grossly out of focus. Cell phones are optimized for close-up family photos in good light. The auto-focus feature made the light into a blurry circle.

5. I was seeing a satellite. It was probably a spy satellite because the north-south orbit allows it to observe all parts of the earth eventually. Obviously it has no lights of its own, but the satellite was still in sunlight high above the earth. When it reached far to the north, it passed into the earth's shadow and went dark.

106. The Sailing Stones

Puzzle: p. 102 Hint: p. 142

The phenomenon starts with a rare winter rainstorm. Researchers found that the shallow water froze, encasing the rocks. As the morning warmed, ice began to melt and water collected below sheets of ice. Ice floes, with the rocks frozen inside them, began to float as melt water collected underneath. The sheets of ice cracked into pieces that were blown by the wind. Even gentle breezes could push the almost frictionless ice floes. The rocks caught in the ice scraped against the lake bed as the ice moved. When all of the ice and water evaporated, the tracks were all that remained. It might be months or years before rains would begin to obscure the tracks.

107. Cryptic Crossword 1

Puzzle: p. 106 Hint: p. 143

Across

1. This is a charade that combines two words into one. Concerning = RE; layer of wood = PLY; answer = REPLY

6. The answer is hidden in the clue. The inside of "pig looked" is IGLOO, an Eskimo dwelling.

7. The exclamation point tells us that the literal meaning of the clue and the wordplay are both formed by the entire clue. The initials of "false ruse and unlawful deception" spell FRAUD.

8. This is a hidden reversal indicated by "backtracking in." Take part of "ones network" and reverse it to get a word meaning "wound up." The answer is TENSE.

9. "So to speak" indicates that this is a homophone. A bargain is a steal, which sounds the same as STEEL (an iron alloy).

Down

1. This is an anagram indicated by "shaking." If we anagram "first", we can create RIFTS (rock fissures).

2. This is a deletion. When we lose the extremities (first and last letters) of "regrets", we get EGRET, which is a heron.

3. "Reportedly" indicates a homophone of "ordinary." Ordinary is plain, which sounds like PLANE (an "aircraft").

4. This is a container clue indicated by the word "boxing." "Fail to keep" defines LOSE; "up" is abbreviated U. Put U inside LOSE and get LOUSE (a bloodsucking insect).

5. The phrase "new arrangement of" suggests an anagram. If we anagram "ye old", we can get YODEL, an Alpine song.

R	E	P	L	Y
I	G	L	O	O
F	R	A	U	D
T	E	N	S	E
S	T	E	E	L

108. Cryptic Crossword 2

Puzzle: p. 106 Hint: p. 143

Across

1. “Almost” indicates some surgery is in order. “Spotted” is a word for dappled. Remove the first and last letters and get APPLE (Granny Smith is a variety of apple).

6. “Gets” indicates a container. King is REX. If we put LA (Los Angeles) in REX, we get RELAX (rest).

7. “Bananas” indicates an anagram. Anagram “or eat” to form ORATE (give a speech).

8. “Split” indicates a hidden word. Look inside “beam in error” to find MINER (prospector).

9. “Somewhat” indicates a hidden word. “Paler than” contains ALERT (meaning “warning signal”).

Down

1. This is a charade of sorts. “To Rome” in Italian is “a Roma.” “Smell” is also AROMA.

2. “Redesigning” indicates an anagram. If we anagram PIER and append L (Roman numeral for 50), we get PERIL (risk).

3. There are two definitions for the same word. PLANE is a verb meaning to “shave wood.” PLANE is also an adjective meaning “flat,” as in a plane surface.

4. “Counter” indicates a reversal; “will leave” indicates a deletion. Reverse “retail” and remove “I” to get LATER (in a while).

5. “Climbing” indicates a reversal; “in” indicates a container. Reverse “tree” and insert “x” (last of ax) to get EXERT (wield).

A	P	P	L	E
R	E	L	A	X
O	R	A	T	E
M	I	N	E	R
A	L	E	R	T

109. Cryptic Crossword 3

Puzzle: p. 107 Hint: p. 143

Across

1. “Talked about” indicates a homophone. A “penny” is a cent, which sounds like SCENT (perfume).

6. “Carried” indicates a container. A walking stick (CANE) carrying “out” (abbreviated O) becomes a CANOE (birch bark).

7. “Discovered” indicates a beheading. Kit Carson is the frontiersman. CARSON beheaded is ARSON (pyromania).

8. “Exchange of” indicates an anagram. EUROS can be anagrammed to get ROUSE (provoke).

9. “Housing” indicates a hidden word. “Stifle ethnic” contains FLEET (meaning “fast”).

Down

1. Mark left (after an injury) is a SCAR. “Loud” refers to music notation for forte (F). A muffler is a SCARF.

2. This clue consists of two meanings. Burnett refers to CAROL. To carol is to sing Xmas songs.

3. Here’s another charade. EN is a printer’s measure; SUE is defined by “process.” ENSUE means to follow.

4. “Turned” indicates a reversal. Reverse “soon” and add E (east) to get NOOSE (loop).

5. “Doctrine” means TENET, which is unchanged (spelled the same) in reverse (in review).

S	C	E	N	T
C	A	N	O	E
A	R	S	O	N
R	O	U	S	E
F	L	E	E	T

110. Cryptic Crossword 4

Puzzle: p. 107 Hint: p. 143

Across

1. “In recession” suggests a reversal. “Dug up minerals” is MINED, which is the reversal of DENIM (jean).

6. “Monkey with” indicates an anagram. If we anagram “a seer”, we get ERASE (defined by “wipe out”).

7. This is a deletion indicated by “out of.” “Run” is abbreviated R. Take R out of BROILS (grills) and get BOILS (cooks in water).

8. “Listening to” indicates a homophone. “False gods” are IDOLS, which sounds like IDLES. “Runs out of gear” defines IDLES (like a car’s engine idling).

9. The initials (“beginnings”) of “the edgy, sullen treatment? Yes!” form the word TESTY (cranky).

Down

1. This is a container. “Me” is I. Put I in DEBT to form DEBIT (an accounting entry).

2. This is another container, but it uses two abbreviations. “English” is abbreviated E; so is “earl.” When EE “has rod”, the result is ERODE, which is “wear down”

3. The short clue suggests that two meanings are used. “Brad’s” could be NAIL’S, and “aces” could be NAILS (meaning to pass with flying colors).

4. This is a charade. “Is” followed by LET (a synonym of “rented”) results in ISLET, a “little atoll.”

5. “Some” indicates a hidden answer. Look inside “domes’ symmetry” and find MESSY (disorganized).

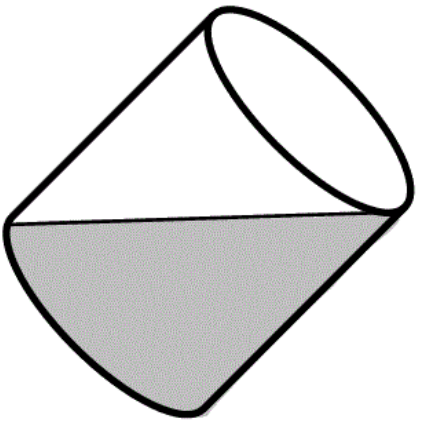
D	E	N	I	M
E	R	A	S	E
B	O	I	L	S
I	D	L	E	S
T	E	S	T	Y

111. Four Gallons Out

Puzzle: p. 108 Hint: p. 143

Challenge 1 – One way to get 4 gallons is to fill the 5-gallon jar, then use it to fill the 3-gallon jar. Pour the 3 gallons back into the cask. Pour the 2 gallons into the 3-gallon jar. Fill the 5-gallon jar, and use it to fill the 3-gallon jar. You now have 4 gallons in the larger jar.

Challenge 2 – Tilt one container and fill it with wine until the wine exactly covers the container bottom and reaches the rim on the other side. This results in half filling the container. Then do the same thing with the other container. You will have 2-1/2 gallons in the 5-gallon container and 1-1/2 gallons in the 3-gallon container. This is a total of 4 gallons.



112. Put Your Cards on the Table

Puzzle: p. 109 Hint: p. 144

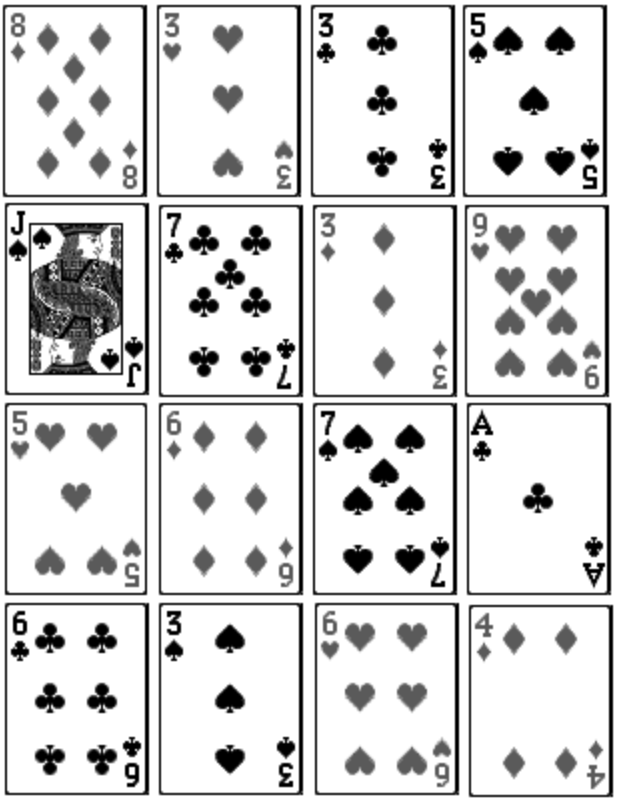
We'll need to switch the clubs and spades in row 2 or in row 4. The first three columns and the first row add up to 21. If we try to get all rows and columns adding to 21, we need to correct the totals in rows 2, 3, and 4 and in column 4. Let's try the obvious move of increasing 2♦ (lower right corner) by 4 to make the last row and last column equal 21. The problem is that 6♦ (the six of diamonds) is already on the table (row 3, column 2), and only cards from the pack can be used as overlays. We can't change the suit of 2♦ because it would require too many other suit changes in other places. Further analysis should convince you that we can't overlay four cards and have all the rows and columns add up to 21.

8D	3H	5C	5S	=21
2C	9S	3D	9H	=23
5H	6D	7S	1C	=19
6C	3S	6H	2D	=17
21	21	21	17	

Because the suit change requires us to overlay two cards in the same row, we will only be able to change three rows with our four overlays. If we try to change each row/column to add up to 17 (the second most common total), we must reduce one of the first three cards on the top row by 4. 3♥ is too low. 5♣ would be 1♣, which is already on the table. 8♦ must be overlaid by 4♦. 2♣ and 9♠ will at least have to change suits. This means that our fourth overlay needs to be 7♠ (row 3, column 3). The problem is that its number must be reduced by 2 for row 3 and by 4 for column 3. 17 won't work as the common total. Similar analysis eliminates 23 as a common total. 19 must be the right number.

Row 1 must come down by 2, row 2 must come down by 4, and row 4 must go up by 2. Columns 1, 2, and 3 must come down by 2. Column 4 must go up by 2. The suit change must occur on row 2. You can't change 3♠ to 1♣ because 1♣ is already on the board. Therefore, overlay 2♣ with 0♠ (a spade face card), and overlay 9♠ with 7♣. Row 4 and column 4 both total to 17; so overlay 2♦ with 4♦. Then overlay 5♣ with 3♣.

If you solve this using real playing cards, you avoid the major trap of reusing cards. Obviously, the jack of spades could be a queen or king.



= 19

= 19

= 19

= 19

= 19 = 19 = 19 = 19

113. How Like a Dove

Puzzle: p. 110 Hint: p. 144

The entire word is like a dove that flies. It could even fly over the first syllable, which appears to be an animal (omnivore). The animal is later eaten by humans. The second part is a very long unit of time. The syllables are pig and eon; so the whole is pigeon.

114. Play with Me

Puzzle: p. 110 Hint: p. 144

When actors refer to "left," they mean the audience's right.
Theater people refer to downstage and upstage instead of front or back.
When a stage is "dark," it means that no show is being presented. But lights can be blazing on a "dark" stage because the actors are rehearsing.
A stage "rail" is a horizontal batten (or pipe) that supports curtains, scenery, or lights.
A stage "leg" is a small curtain at the edge of the stage used to mask the wing.
A stage "wing" is the area offstage to the right or left of center stage.
The audience comes to hear the performers, not the stage.
The theater (the stage) attracts performers, but can be the source of stage fright.
Stage "hands" tend to stay backstage, out of sight.
When a play is presented, the audience members buy tickets.
Shakespeare said "all the world's a stage," and many people have repeated it.
The riddle's title refers to a play performed with a stage.
The Mojave Desert story concerned banditos raiding a stagecoach station.

115. One Black Knight

Puzzle: p. 111 Hint: p. 144

The first move must be to QB4 (between the black and white pawns) because any other move would allow White the chance to capture the knight immediately (if White is allowed a turn). Obviously the black knight cannot land on any square already occupied by a black piece. The second move will only allow K5 or a return to the original QR3 square. At move three, there are two possible directions; so, let's work backwards from the goal for a while.

Working backwards, all squares that are one knight's move away from the "X" are guarded by white. Have we proven the puzzle to be impossible? Not yet. Can we capture any of the pieces guarding these squares? Suppose the bishop could be captured (and thereby removed from the board). If so, we might attack the "X" square from KB7. But if we capture the bishop, we lose our knight to the white knight. And we would never remove the protecting knight without being attacked on the preceding move. Similarly, the pieces on the left side of the board all protect each other. Therefore, the puzzle appears to be impossible unless we are missing some trick.

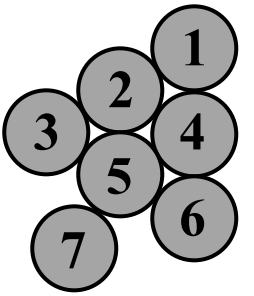
The key to the puzzle is the white pawn in the center of the board. If it can be captured and the knight can move off the square, the black bishop at KN2 will ***check*** the white king. This "discovered check" would force White to act against the threatening bishop instead of the knight (if White were allowed to move). White cannot attack the black knight since its move must be to escape check. To remove the key pawn and complete the puzzle, the knight's moves are:

1. QR3 to QB4
2. QB4 to K5
3. K5 to KN4
4. KN4 to KR6
5. KR6 to KB5
6. KB5 to KN3
7. KN3 to K4 (Pawn capture)
8. K4 to Q6 (Discovered check)
9. Q6 to QB8 (Mission accomplished)

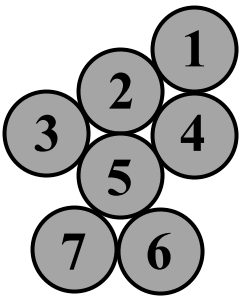
116. Coin Arrowhead

Puzzle: p. 112 Hint: p. 145

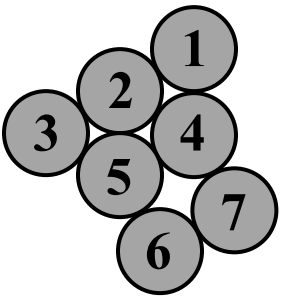
Here is one solution moving only two coins (in four moves).



Step 1: Move coin 6 (lower right) to form a triangle with coin 5 (center) and coin 7 (tail).
Step 2: Move coin 7 to form a triangle with coin 6 and coin 4.
Step 3: Move coin 6 to form a triangle with coin 7 and coin 4.
Step 4: Move coin 7 to form a triangle with coin 4 and coin 5.



Step 1



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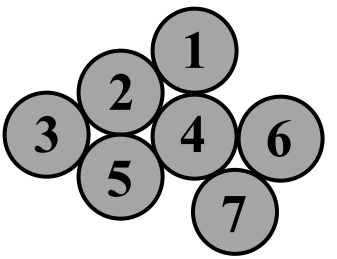
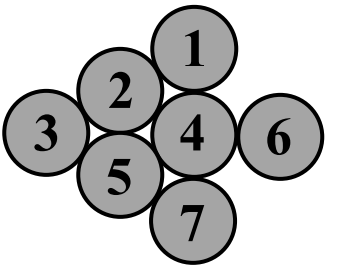


Step 3



Step 4

117. Covered Spheres

Puzzle: p. 113 Hint: p. 145

Mercury (density 13.534 g/cm^3) is more dense than steel (density 8.05 g/cm^3). This means that the steel balls will tend to float on the liquid mercury. Therefore, no matter how much mercury you pour into the container, the steel balls would not be submerged.

118. Dicey Situation

Puzzle: p. 114 Hint: p. 145

If you choose A, then B has the advantage over you, but you have the advantage over C. Why is this? Look at the possible results of rolling A and B: A=1/B=2, A=1/B=6, A=1/B=7, A=5/B=2, A=5/B=6, A=5/B=7, A=9/B=2, A=9/B=6, A=9/B=7. In five of the nine cases, B scores a point. But here are the results of rolling A and C: A=1/C=3, A=1/C=4, A=1/C=8, A=5/C=3, A=5/C=4, A=5/C=8, A=9/C=3, A=9/C=4, A=9/C=8. In five of the nine cases, A scores a point. If B beats A, then maybe the smart player should choose B. Look at the possible results of rolling B and C: B=2/C=3, B=2/C=4, B=2/C=8, B=6/C=3, B=6/C=4, B=6/C=8, B=7/C=3, B=7/C=4, B=7/C=8. In five of the nine cases, C scores a point. So, none of the dice dominates the other two. You should try to be the second player. If the first player picks A, you pick B. If the first player picks B, you pick C. If the first player picks C, you pick A. In each case you will tend to win five times out of nine.

119. 4x4 Grouping

Puzzle: p. 115 Hint: p. 146

These are what the pictures were intended to be (top to bottom, left to right):
Table or bench, noon, cigar, pants or trousers, torch, level, kayak, candle, French doors, rocket, French fries, centipede, French toast, roast chicken, French horn, and radar.

When the pictures are identified the way we did above, one category becomes clear: objects with ‘French’ in their names. The cigar, the torch, the candle, and the rocket are all things that burn. Radar and noon are strange things to draw; perhaps their commonality relates to the words. They are both palindromes (spelled the same forwards and backwards). So are level and kayak. Our third group is palindromes. The last four objects are the table, the trousers, the centipede, and the roast chicken; each of these has legs.

Group 1: Things with legs: bench, pants, centipede, roast chicken

Group 2: Palindromes (words spelled the same forwards and backwards): noon, level, kayak, radar

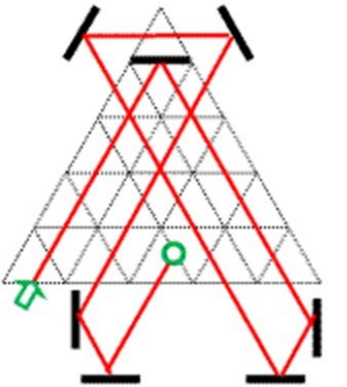
Group 3: 'French': French doors, French fries, French toast, French horn

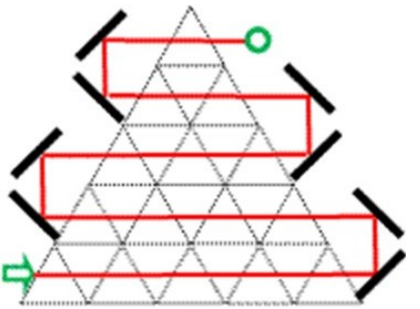
Group 4: Things you light (burn): cigar, torch, candle, rocket

120. Laser & Mirrors

Puzzle: p. 116 Hint: p. 146

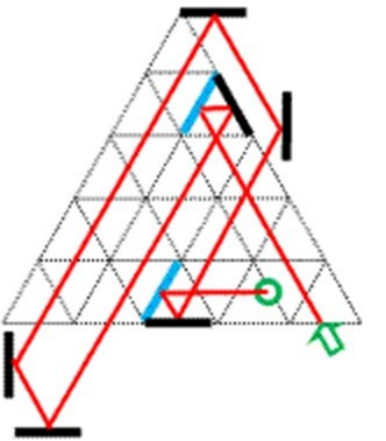
Challenge 1: Stopping the first line one area short of a full row saves one mirror and changes direction the same way as the two-mirror "V" arrangement. Putting the mirrors outside of the large triangle provides a way to move from one row to a parallel row. Other solutions are possible.

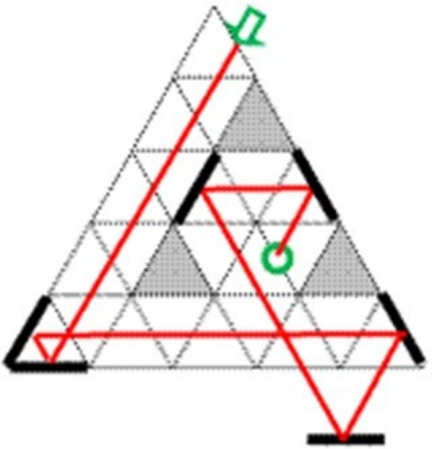




Challenge 2: My solution is a terribly boring zigzag search pattern. If you came up with a more imaginative approach, give yourself some bonus points.

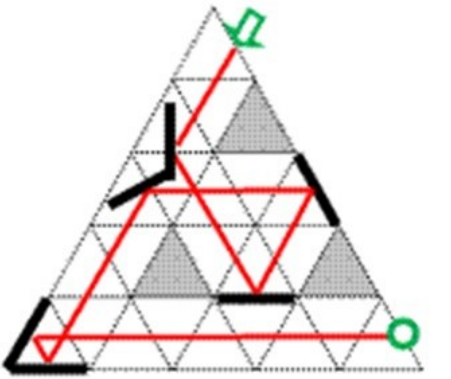
Challenge 3: This solution combines some of the techniques seen in the solution to Challenge 1. It uses both of the pre-positioned mirrors. Did you find a better answer?





Challenge 4: This solution is probably the most straightforward one. Next, you have a more difficult challenge.

Challenge 5: This solution introduces a new mirror angle. The beam travels through the middle of all 22 areas without leaving the large triangle. The two straight sections near the projector and the receiver must be at the start and end of the beam. Too many mirrors are needed to get back out of these sections.



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(Homophone, Mondegreen)

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