



BRAIN BUSTERS

From the Japan Airlines inflight magazine, *Skyward*

by Ed Pegg Jr

- 1 Place letters in the empty squares to get 11 words reading across and down.

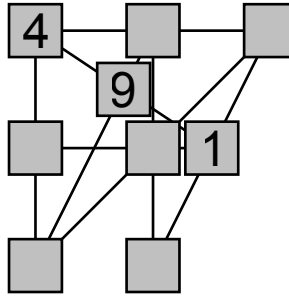
O		A	S		
	T		I		
L	A	D	I	D	A
	L		E		
D	T		T		

- 2 Al, Bob, Cal, Dot, and Ed all bought items from the mail-order magazine. Al&Bob paid \$150, Bob&Cal paid \$200, Cal&Dot paid \$170, Dot&Ed paid \$210, and Ed&Al paid \$100. How much did each person spend?

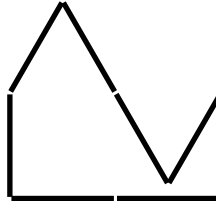
- 3 Multiplying my age by 6 then subtracting 6 produces the same result as subtracting 7 from my age then multiplying by 7. How old am I?

- 4 In how many ways can 4 apples be distributed among 4 people - A, B, C, and D?

- 5 Arrange the number 1 to 9 in the boxes below so that each line of 3 boxes sums to 14. 3 numbers have already been placed.



- 6 Divide the following figure in half by adding 2 toothpicks.



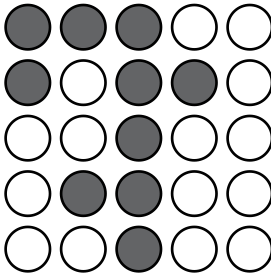
				7	4
	5	1		9	8
8		5			
2		4			
	8	9	2	7	4
		6		1	
		3		6	
7	9			4	3
5	1				

- 7 What number should replace the question mark?

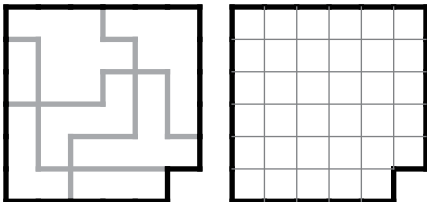
1		2	2		1
	1			9	
3		7	5		7
3		4	6		9
	7			?	
5		9	4		7

by Ed Pegg Jr

- 1 Place numbers 1 to 15 in the white circles so that the distance from 1 to 2, 2-3, 3-4 and so on progressively increase each time.



- 2 A plot of land with a corner missing can be divided into 7 unequal sized pieces with 3 lines, following the gridlines as below. None line crosses itself, and each crosses the other lines just once. Following these rules, divide the land into 7 equally sized pieces with 3 cuts.

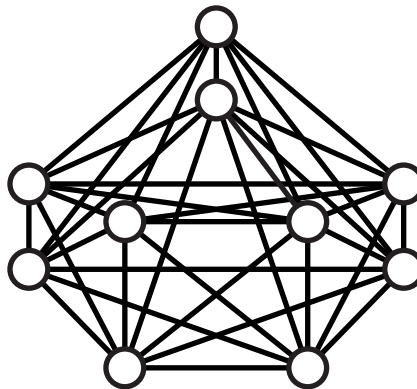


- 3 What do these 7 words have in common?

commerce, canoodle, funnel, recessive, bottom, steering, serrated

- 4 What well-known seven word phrase can be made simply using the letters that appear in MISANTHROPE?

- 5 Arrange the numbers 0 to 9 in the circles so that no two consecutive numbers are connected by a straight line.

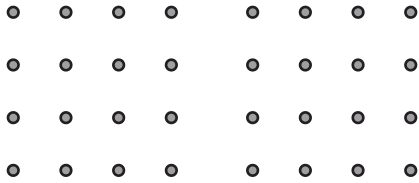


- 6 In a game, you are forced to choose a warrior to fight against. All the warriors are waiting with their swords sheathed. One has a straight sword, another has a helical sword, a third has a semicircular sword, while the last has a wavy sword. Which one should you pick?

8	3	5	1	6	2	9
7						3
				3	6	1
			8			
		7	2	5		
		1				
9	5	6				
2						7
6	7	8	9	2	4	5

by Ed Pegg Jr

1 Without lifting the pen from the paper, 6 lines can be drawn through the 4x4 grid of dots below, with the starting and ending points the same. How many circular arcs are necessary, in the same grid?



2 A picture with a wire rope on the back is hung on two nails. However, if either nail is removed, the picture will fall. How is wire hung on the nails?

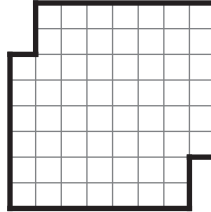
3 What word is the odd one out?
 PROCRASTINATING JARGONIZE
 ALCHEMY ENVIRONMENT
 PUMPERNICKEL RINGLEADER

4 What is the highest number of pieces a round cake can be cut into with 5 straight vertical cuts?

5 "Reforestation" has the apt anagram "A ton o' fir trees." The letters of the word are used to give a clue for the word itself. Find the word clued by each of the following apt anagrams.

- Is abc's
- A bar, etc.
- i.e. Talon
- Evade it!
- Blah! Mess!
- Deem as minor
- Go in, top star
- I call a miscount

6 A piece of land has two corners missing. Can you indicate on the gridlines how the land can be divided into 4 pieces with identical size and shape?



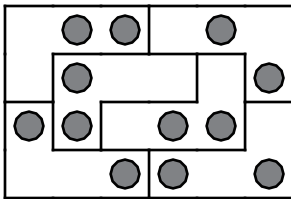
		9	8	3		
	9				1	
4		2			6	
	1				9	
		5	6	7		
	4				3	
7		1			2	
	5				6	
		6	4	8		

7 A consonancy is a set of words with the same consonants in the same order, such as ocarina and acorn. What are consonancies for BEACH-MASTER (a male elephant seal) and COMPANY STORE?

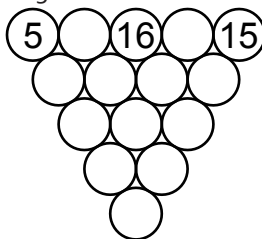
8 A metal dealer bought a golden cube, 10 cm on each side, with a mass of 19.3 kilograms. The density of gold is 19.3 grams per cubic centimeter. It turned out that the cube wasn't gold. How was the dealer fooled?

by Ed Pegg Jr

1 There are six different ways to put 2 dots in a 4-square L shape. Arrange the 6 pieces in a 4x6 rectangle so that the 12 dots are connected. You may flip the pieces over.



2 A superstitious pool player didn't like 8-balls, so he had a 16-ball specially made. When he racked the balls up, he always arranged them so the each ball was the difference of the 2 balls above it. Can you find the arrangement he used?



3 Japanese yen are made of aluminum, and circuit boards contain copper. Match these elements with the product they are found in.

Americium (Am), Bismuth(Bi), Cerium (Ce), Magnesium (Mg), Neodymium (Nd), Polonium (Po), Rhodium (Rh), Titanium (Ti), Tungsten (W), Zirconium (Zr)

- a. Antistatic brush
- b. Earbud speaker magnet
- c. Firestarter bar
- d. Lightbulb
- e. Flashbulbs
- f. Optical reflector
- g. Safe shotgun shot
- h. Tennis racket
- i. Smoke detector
- j. Lighter flint

4 What do these cities have in common: Tokyo, Japan; Albuquerque, United States; Teheran, Iran; Nicosia, Cyprus; Tanger, Morocco; and Canberra, Australia?

	7	9	8	4	2
4				8	5
5			7		6
9		4			8
3	1				2
1	2				3
	6	2	9	5	4

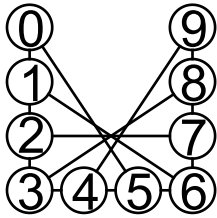
5 By multiplying the digits of 679, it takes 5 steps to get to a single figure (679 6x7x9 = 378 3x7x8 = 168 1x6x8 = 48 -4x8 = 32 3x2 = 6). What are the smallest numbers for which it takes 3 and 4 steps?

6 $19 = T_2 + T_3 + T_4$ or $T_1 + T_2 + T_5$,
 $41 = T_2 + T_4 + T_7$ or $T_4 + T_4 + T_6$,
 $42 = T_2 + T_2 + T_8$ or $T_3 + T_5 + T_6$,
 $43 = T_1 + T_3 + T_8$ or $T_1 + T_6 + T_6$.
 What is 81? Hint: Triangles.

by Ed Pegg Jr

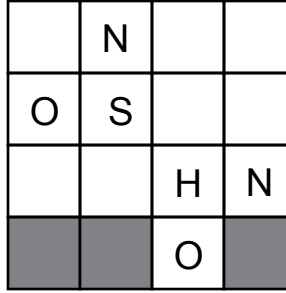
1 "Here we are at a square table, facing north, south, east, and west, and having the names North, South, East, and West. But none of us has a name that matches the direction we face," said the man facing north. "That's an interesting observation," Mr. East said, turning to his right. "Don't you agree, Mr. South?" Where is everyone sitting?

2 The numbers below are connected when they differ by 1 or 5. What is the fewest possible number of line crossings?



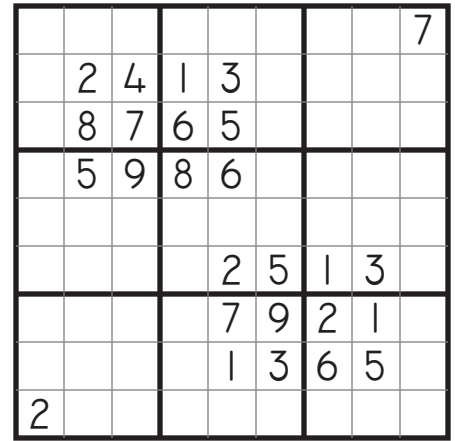
3 What 2-syllable words starting with L, M, N, O, and P all rhyme with one another?

4 Add the letters of PRIMATE to the puzzle below so that a chess king could move one square at a time to spell out the phrase "One man's meat is another man's poison."

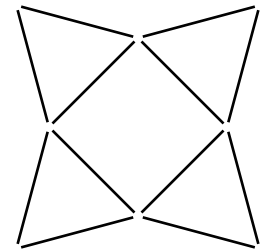


5 What do these words have in common?
BALL LEST MUSS POT TUN

6 In a 2-player game, each person may remove 1, 2, or 3 coins, but not the same number as the previous player. Whoever takes the last coin or coins wins. If the game starts with 9 coins and it is your turn first, how many should you remove to guarantee a win?



7 The 12 matches shown make 1 square and 4 triangles. Move the matches so that they make 3 squares and 8 triangles.



by Ed Pegg Jr

1 **Redwolf Silvercat Goldfox
Whitehawk Grayhorse**

I saw these names over animal living areas 1 to 5. Curiously, none of the colors or animals matched the actual animal, or even a nearby animal. None of the names described another animal.

"My little joke," explained the owner.

I shook my head. "I'm glad Goldfox isn't a horse." Can you determine the color and type of each animal?

RW SC GF WH GH



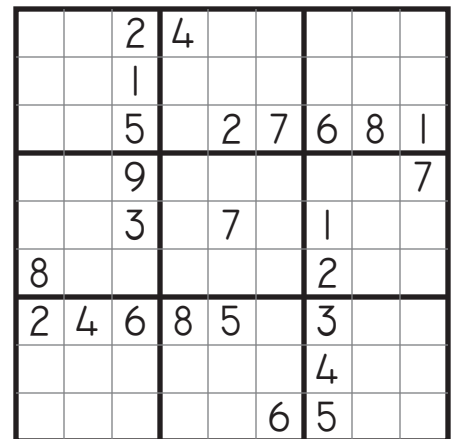
2 On my broken calculator with keys + - ÷ × =, the only functional number is 7. How can I get 34 to appear in the readout?

3 Match each country with its national or symbolic bird.

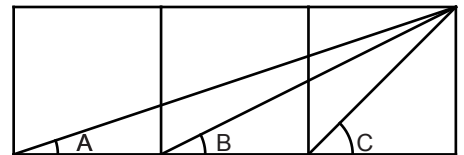
- | | |
|-------------------|----------------------|
| 1. Australia | a. bald eagle |
| 2. Bahamas | b. blackbird |
| 3. Canada | c. common loon |
| 4. Germany | d. dodo |
| 5. India | e. emu |
| 6. Japan | f. greater flamingo |
| 7. Mauritius | g. green pheasant |
| 8. Sweden | h. black-bill magpie |
| 9. South Korea | i. blue peafowl |
| 10. United States | j. white stork |

4 On a worn, 39 cm ruler, the only marks remaining are at 0, 8, 15, 17, 20, 21, 31, and 39. What is the shortest distance that cannot be measured between 2 marks?

5 What do these 12 words have in common: poll, hock, dock, stifle, flank, withers, crest, cannon, muzzle, chestnut, croup, shank.



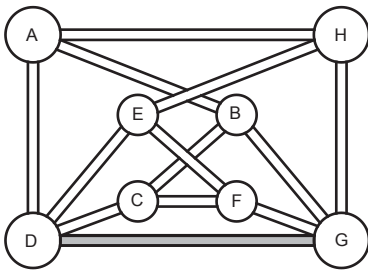
6 In the squares below, which is the greater angle?. A+B, or C?



by Ed Pegg Jr

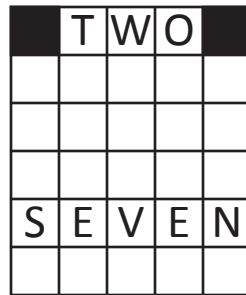
1 The water hyacinth is a fast-growing weed, able to double the size of its colony every 2 weeks. A square meter colony of is in a 1-square-kilometer lake. how long does it take to cover the lake?

2 On the map below, the route ABCDEFGHA is an example of a cycle, a journey that ends at the starting point, without reusing any road. ABCDA, BCFGB, CDEFC, DEHAD, EFGHE, and GHABG is a set of these cycles that uses every road exactly twice, except for road DG, a new road. Find a set of cycles that uses each road exactly twice.

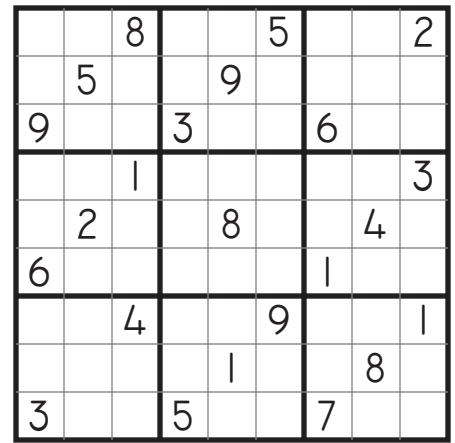


by Ed Pegg Jr

3 Place words zero, one, two, three, four, five, six, seven, eight, nine, and ten into the puzzle below. The words may read horizontally, vertically, or diagonally. TWO and SEVEN have already been placed.



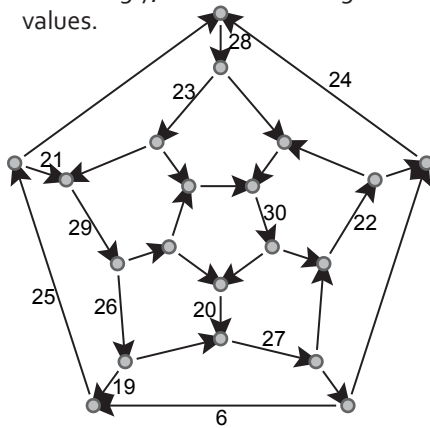
4 Club member numbers are on transparent badges. Two badges are overlaid, making what looks like 89. Neither badge has 8 or 9, but the sum of the badges is 89. What are the numbers?



5 The letter triple "azz" occurs twice in razzmatazz. What words contain each of the following triples twice?

ach ama ant ard ckt eno hua
igh mat ono osc own phi rac
tic tor und utt

1 In the diagram below, each circle's inflow equals its outflow. For example, with the circle at the bottom left, the inflow of 19+6 equals the outflow of 25. In addition, all of the flows are different numbers, from 1 to 30. Accordingly, enter the missing values.



2 Two identical-looking songbirds are mistakenly put in the same cage. One is a city bird, and the other is from deep in the forest. How can they be identified?

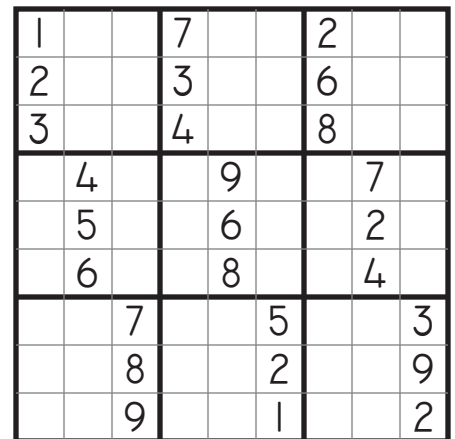
by Ed Pegg Jr

3 Where are each of the following created by the body, and where are they removed? All answers are in the box below.

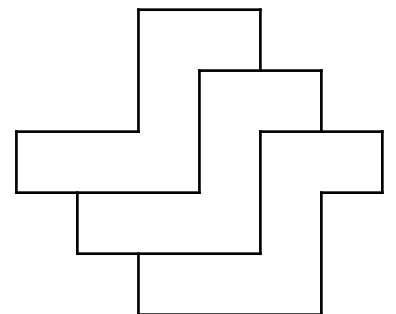
Item	Created in	Removed by
blood cells		
gastric acid		
insulin		
renin		
urea		
	kidneys duodenum liver pancreas	
	stomach spleen bone marrow	

4 In a foot race, Abe was neither first nor last. Cal beat Doug, Bruce beat Abe, Abe beat Ed but was beaten by Cal, and Doug beat Bruce. Who was last?

5 Raoul asked his brother's wife's mother-in-law's only husband's only daughter to join him and his wife for lunch. What relation is she to Raoul?

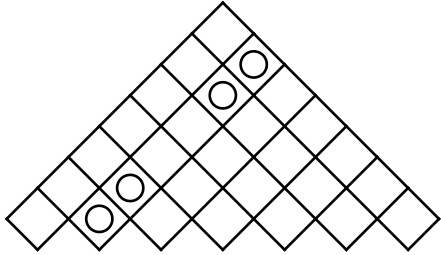


6 Move 1 shape to obtain a symmetric figure.



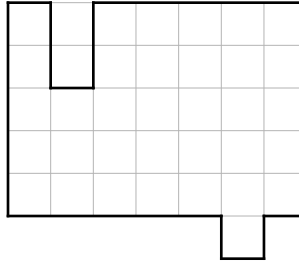
1 On my puzzle shelf, Will Shortz is before Sam Loyd and after Henry Dudeney. Nob Yoshigahara is between Martin Gardner and Dudeney. Also, Gardner is directly before Shortz. What is the order of my puzzle books?

2 In a triangular garden, 4 plants are in a row. Add 6 more plants to make 5 rows of 4 plants. Each plant must be in one of the square plots.



3 One bag of potatoes weighs 30kg plus 1/4 of its weight. Another bag weighs 32kg plus 1/5 of its weight. Which bag is heavier?

4 Divide the shape into two identical pieces.



5 16 golfers (A to P) play in foursomes over five days. After the first day, they decide on groups for the following days. Fill out the rest of the schedule below so each golfer plays once each day, and plays just once with every other golfer. Starting hint: on day 5, golfer D cannot play with A, B, or C.

day1	day2	day3	day4	day5
ABCD	GIP	M	IH	G
EFGH	N	FOD	EJ	JOB
IJKL	CEL	PLH	AK	AM
MNOP	DK	NK	B	CF

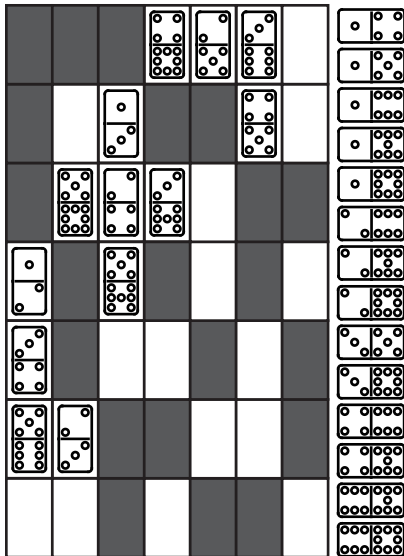
	3	6	9				
		2		7	1		
5			4	1			
3							
6							
9		8	4	6	7		
		4	7	2			
		1				5	4
						9	2

6 You have 15 true coins and 1 fake coin, which is heavier or lighter than the others. With 2 weighings on a balance scale, how do you determine whether the fake coin is heavier or lighter?

7 At a party, each guest had 1/2 a bowl of rice, 1/3 of a bowl of rice, and a 1/4 of a bowl of meat. There are 65 bowls. How many guests were there? (Sun Tsu Suan-Ching, 4th century AD)

by Ed Pegg Jr

1 Place the dominoes on the right into the blank areas in the puzzle so that every row and column contains the dots 1-8.



2 A merchant sells 2 items for 9999 yen each -- one at a 10% profit, the other at a 10% loss. Overall, did the merchant make or lose money?

3 Substitute the numbers 1-9 for the letters a-i to make this equation correct.

$$a/bc + d/ef + g/hi = 1$$

Hint: $g > d > a$, and $ef > bc > hi$.

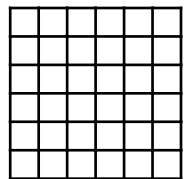
4 The words "determinable" and "bewilderment" share most letters, a and w being the only ones unique to each. Match up the words below that differ by a single letter.

californium	centenarian
groundwater	guttersnipe
infomercial	kitchenware
maintenance	necessarily
parentheses	pretentious
screenplays	spreadsheet
undergrowth	windcheater

5 3256 has the consecutive pairs 32, 24, 45, and each is the product of single digits (4x8, 5x5, and 7x8). Arrange the digits of 1-9 so that every consecutive pair is the product of single digits.

					9
	4	3			7
9		1		5	
8	3		5		
			3		
		7		1	6
	9		2		4
1			8	6	
6					

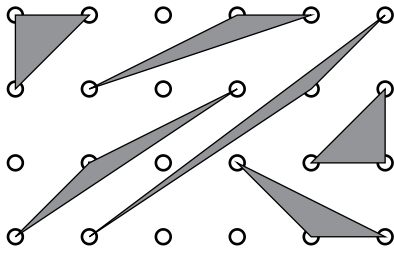
6 In the 6x6 grid, insert 12 X's so that no 3 X's appear in any column, row, or diagonal.



7 On 7 different business trips, 15 travellers are put into rows 5 to 9, seats A to C. But none of these 15 ever wind up sitting in the same row. How? Hint: look at problem 1.

by Ed Pegg Jr

1 Which triangle has the greater area?
(1 Figure4Triangles.svg)



2 Three colored cups in a line each have a prominent feature.

- a) blue is left of love.
- b) logo is left of blue.
- c) name is left of love.
- d) gray is left of pink.

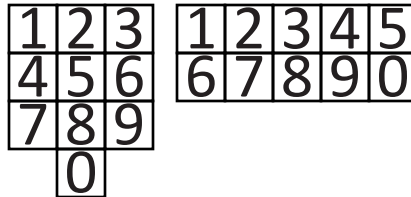
Where is each cup?

3 If 75% of girls are righthanded, 75% long-haired, and 75% brown-eyed, what is the minimal percentage of right-handed, long-haired, brown-eyed girls?

4 In the fractions $19/95$, deleting the 9's gives $1/5$. Usually, such a deletion results in the wrong answer, but here it is correct. A longer example is $124/217 = 4/7$. In the fractions below, add digits to the blanks so that deletion still gives the right answer.

$$\frac{\underline{\quad}3}{\underline{\quad}8} = \frac{3}{8} \quad \frac{1\underline{\quad}}{\underline{\quad}2} = \frac{1}{2}$$

5 A number with 6 different digits can be input into either keypad below so that every digit horizontally, vertically, or diagonally adjacent to the previous one. If the last digit is lowest than the 1st, what is the number?



	7	4	6	1			
9				7			
1				2			
7				1		8	
	5			4		6	
	8		3				9
			8				3
			9				1
				5	4	8	2

6 What do these words have in common?

pussycat, quagmire, taxicab, bathtub

7 You have 12 kilos of nails and a large 2-pan balance. How can you measure out 9 kilos of nails?

8 Remove the letters EPIC from WIRELESS COMPUTING, and rearrange the remaining letters to form a sport.

by Ed Pegg Jr

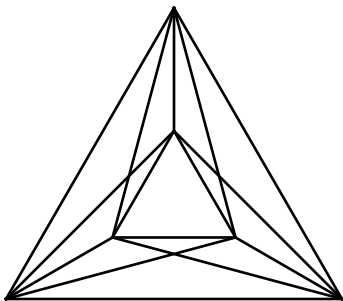
1 Add the letters to the word PERCENT and rearrange to form a new word indicated by the clue.

HIATAL (like this)

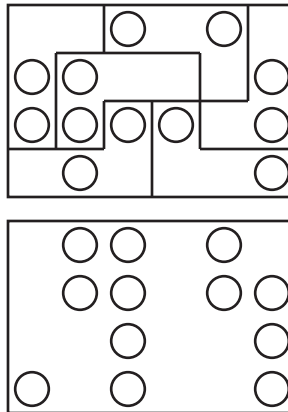
Answer: PARENTHETICAL.

- IT catch
- RA cabinetmaker
- IE earthquake focus
- II obtains a gift
- FIO unparelled
- PIA new to a trade
- AMID dilemma

2 How many triangles in the figure below?



3 There are 6 ways to put 2 holes in an L-tetromino. Place the 6 holey tetrominoes into the figure on the bottom.



4 In lottery A, 6 balls drawn from a bag of 14 consecutively numbered balls have to match the 6 numbers on the ticket. In lottery B, 5 balls drawn from a bag of 15 consecutively numbered balls have to match the 5 numbers on the ticket. Which lottery offers the better odds of winning?

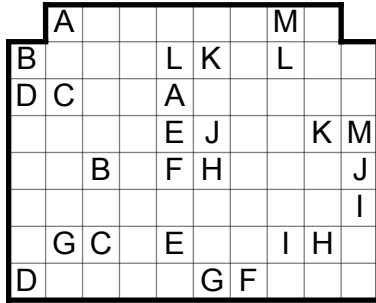
		4	1	9	5			
		2						
6	8	5						
3				2			4	
8				3			7	
9				7			1	
						8	4	6
						7		
				2	6	8	9	

5 A 5-digit number has digits whose sum is 35. Can it be a square?

6 You have 13 different weights labeled from 1 to 13 grams. One of them weighs slightly more or less than its label. With three weighings on a balance scale, identify the inaccurate weight, and whether it is heavier or lighter.

by Ed Pegg Jr

1 In the puzzle below, join each letter pair (AA, BB, etc.) by moving 1 square at a time, horizontally or vertically, so that each shape is 6 squares long and fits together with the rest.



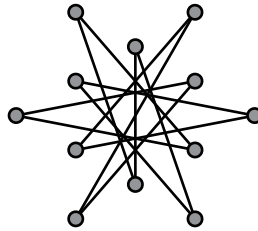
2 What movie genre has 4 consecutive letters of the alphabet in order? What theatre job has the same property?

3 Ali owes Brian a drink. Brian owes Carlo two drinks. Carlo owes Dmitri three drinks. Dmitri owes Ali four drinks. How can the drink debts be settled in the simplest fashion?

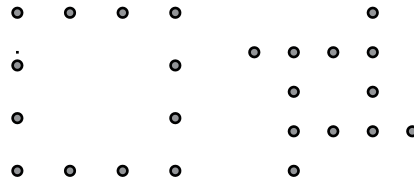
by Ed Pegg Jr

4 How many words of 4 or more letters can you make from MACHINE? Rules: each letter may be used only once per word, no hyphens, no accents, no proper names.

5 A tour joins up dots in a loop with straight lines. An example of a longest tour is shown here.



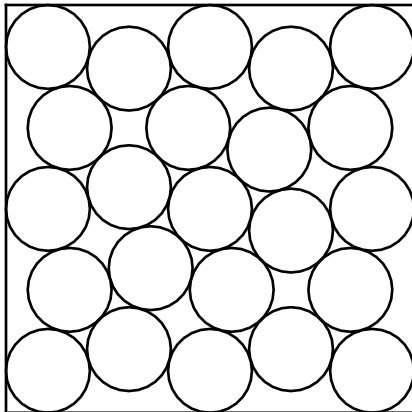
For each set of 12 points, find the longest tour.



			4	5		
	9	6	2		3	
8			7		1	
1					7	
		5			8	
	3				2	
	6		8		9	
	8			9	7	4
		2	5			

6 A three letter word related to auctions has an odd property. In CAPITAL letters, it is up/down symmetric. In lowercase letters, it is left/right symmetric. What is it?

1 23 coins can be packed tightly into a square. How many lines go through the centers of 3 or more coins? Is it possible to pick 7 of these lines to go through the centers of all 23 coins?



2 The repeated digital sum, or digital root of 6788 is 2. ($6+7+8+8=29 \rightarrow 2+9=11 \rightarrow 1+1=2$). What is the digital root of the 180-digit number 10111213...96979898, made from the numbers 10 to 99?

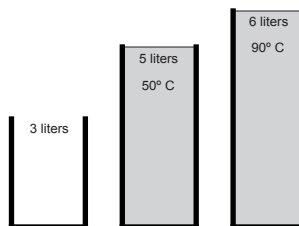
by Ed Pegg Jr

3 Match these actors with their birth names.

- Allan Konigsberg
- Alphonso D'Abruzzo
- Archibald Leach
- Bernard Schwartz
- Issur Demsky
- Jerome Silberman
- John Carter
- Krishna Bhanji
- László Löwenstein
- Marion Morrison
- Maurice Micklewhite
- Nathan Birnbaum
- Ramon Estevez
- Volodymyr Palanyuk
- William Pratt

- Alan Alda
- Ben Kingsley
- Boris Karloff
- Cary Grant
- Charlton Heston
- Gene Wilder
- George Burns
- Jack Palance
- John Wayne
- Kirk Douglas
- Martin Sheen
- Michael Caine
- Peter Lorre
- Tony Curtis
- Woody Allen

4 Water at 50° C and 90° C is in 5 liter and 6 liter containers. A 3 liter container is available. How can some 70° C water be obtained?

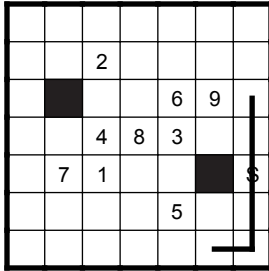


			5	7	9	
					2	
1	3		4			
			3	8	4	6
5						1
4	2	6	9			
				5	6	7
		4				
		8	9	3		

5 He is noble, He is rare.
He can lift you in the air.
He will change your timbre, free.
So I ask you, who is He?

6 The 9-digit number 2^{29} has 9 different digits. Which digit is missing? Hint: The repeated digit sums of 16,32,64, and 128, are 7, 5, 1, 2.

- 1 A garden path loops back to the starting square (S), and crosses itself nine times in the numbered squares. If you follow the path, and count off every other number, the sequence will be 1, 2, 3, 4, 5, 6, 7, 8, 9. All but the two black squares are visited.



- 2 HAVE A LITTLE FAITH IN ME -- what amazing property does this song title have?
- 3 With a rubber band, you can make a 5-pointed star with one hand. If the band touches 5 digits, the answer is easy. How can it be done with the band touching just 3 fingers?

- 4 A person claims that they can instantly count how many paperclips are in a large pile. How can the person be quickly tested?

- 5 What do these words have in common: buy, bring, catch, fight, seek, teach, think?

- 6 All the digits occur once in the sum $7/98 + 4/56 = 3/21$. Find two more sums with the same property, using final fractions $4/39$ and $5/48$.

- 7 Fill in missing letters with a 12-letter word to get 6 words reading across.

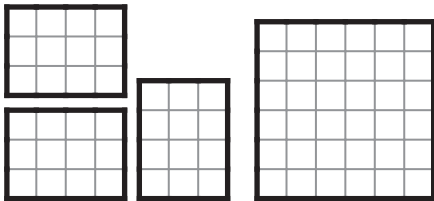
		E	A	T	E	R	
S			R	I	S	E	
F	E			R	A	L	
H	A	I				U	T
D	E	V	E				P
A	P	P	L	A			

	2	4	1	8	3	6	9
	5						1
	8			1			6
	6		3		2		7
	9			4			2
	7						3
	4	9	6	2	5	7	8

- 8 Benjamin Franklin Goodrich, usually called B. F. Goodrich, was an industrialist whose company still makes tires. If the letters "aiinnorr" are struck out from his full name, what remarkable thing remains?

by Ed Pegg Jr

- 1 The three 3x4 office areas need to be divided into 6 different shapes, each with area 6 and with extra cubical walls following the grid lines. How can this be done?

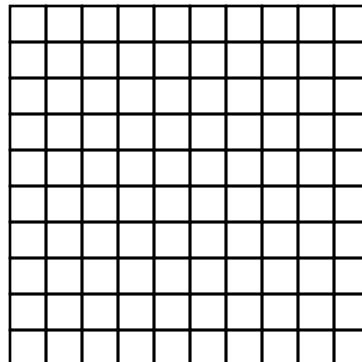


- 2 The six cubical offices above now need to be fit into the 6x6 area. How?
- 3 Fill in the blanks to get English words and phrases.

domi__re_ (controlled)
 _do__mi_re (video editor)
 _re_do__mi_ (peace)
 mi__re__do_ (mutt)
 _re__mid o__ (Egypt wonder)

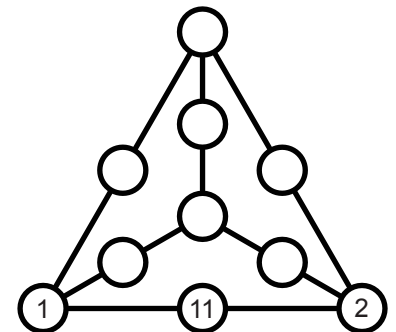
- 4 What do these companies have in common: Citigroup, Ford, Kellogg, Macy's, Qwest, Ryder, Sprint-Nextel, AT&T, Visa, and United States Steel?

- 5 In the game of battleships, a 1x4 battleship and other ships are placed on a 10x10 grid. The opponent calls out shots and tries to sink the ships. What is the minimum number of shots needed to guarantee a hit on the battleship?



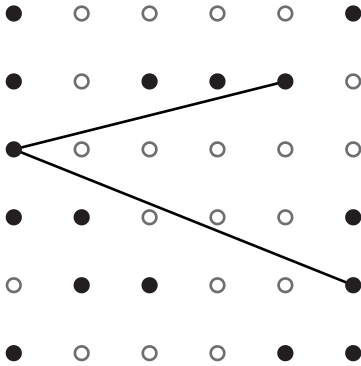
			8				
		5	1				
	4		3		8		
	1	9	7		4		
5	6				2		9
	9	8	2		5		
	8		9		6		
		7	5				
			4				

- 6 Add numbers 3 to 9 to the figure below so that each line adds to 14.

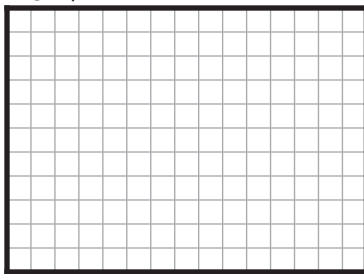


by Ed Pegg Jr

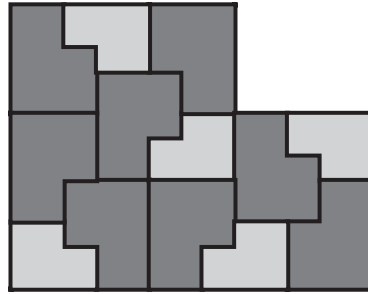
1 Make a closed loop by joining the black dots with straight lines of different lengths.



2 Divide the below 11x15 rectangle into 9 squares.



3 In the below shape, how many similar copies of the same shape can be found?



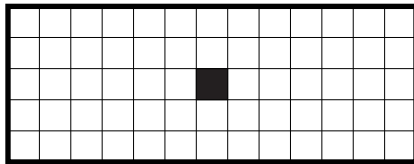
4 Fill in the blanks with letters from the roman numerals MDCLXVI:
 ___e__eta__ (very colorful)
 ___nse_t___a__ (bug killing)
 ___n__a__st__ (simple)
 ___e__e__n__t__a__ (For Bush, W)
 ___en____ (Caesar quote)
 ___e__an__us__ (hot jazz)
 ___e__B.__e____e (famed director)
 a___e__o__u__n__st (e.g., Dear Abby)
 we__-____ers__f__e__ (portfolio quality)
 he_a_e___a___g__t (F in FACE)
 ___e__e__a__e____ne
 (often used leeches)

9	5								1
	3	2						4	7
		7	3			2	8		
			5		2	1			
		1	4		8				
	4	8			5	6			
6	2					9	7		
3							5	8	

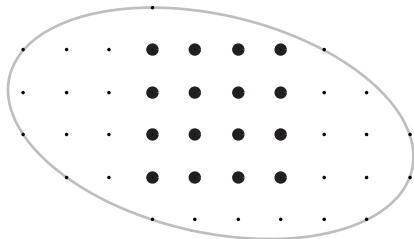
- 5 What type of clock has the most moving parts?
- 6 You take a bowl of soup from a microwave, and turn right. To you, which way does the soup turn?
- 7 What is the resulting word if you remove the first and last sounds of the word QUARANTINE?

by Ed Pegg Jr

1 A 5x13 piece of carpet has a hole at the center. Divide it along the grid lines into 4 pieces that together can make an 8x8 square.



2 With 5 straight lines, draw through all but two points in the 4x4 grid, without lifting your pen, ending up where you started. Do not go outside the given oval.



3 The hour hand of a watch is exactly on a second mark, and is exactly 18 second marks ahead of the second hand. What time is it?

4 In dvixndfrtgdwifoduglnfsimvgrfxtolignwemupqseklroventmjxekplqwusojrmbkxbvtbpbjbxkcsuwjchacapacagh, there is 1 character between each of 4 a's, 2 characters between the 4 b's, 3 between c's, and so on up to 24 characters between the four x's. Do the same with numerals in triplicate, so that there is one digit between the three 1's, 2 digits between the three 2's, and so on. Some digits have been given for you.

-----746925-----

5 Finish the second square, so that for any pair of numbers 1 to 16, the chosen pair will be in a row, column, or main diagonal in exactly one of the two squares. Hint: Sum 34.

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

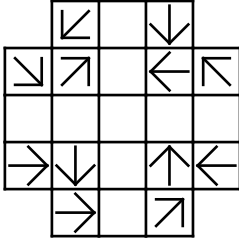
9	4		

2	7	5	1	3				
		4						
		3		8	6	7	2	4
		7				1		
		1				2		
		6				8		
1	5	9	2	4		3		
						9		
				6	8	4	5	1

- 6 On, I fly. Off, I float. What am I?
- 7 A certain collectible card game has 1 of 50 rare cards in each booster pack. About how many booster packs would be needed to get a complete set of the 50 rare cards? Hint: The solution is helped by the sequence $1/1 + 1/2 + 1/3 + 1/4 + \dots$

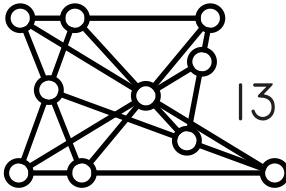
by Ed Pegg Jr

1 A chess king can move one space in any direction. Show how a king can make a tour of all 21 squares in the board below, with no direction being repeated in any row or column.



2 Fill in each blank with a number from 0 to 3. Numbers can be re-used.
 ___ Number of blanks with a digit < 2.
 ___ Number of blanks with a digit = 2.
 ___ Number of blanks with a digit > 2.

3 Put numbers 0-9 in the circles so that each line adds to 13.



by Ed Pegg Jr

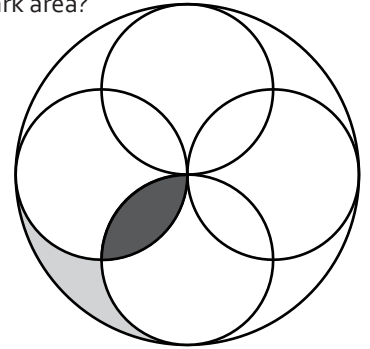
4 Match the beverage with its notable ingredient

- | | |
|----------------|--------------|
| 1. Absinthe | a. 130 herbs |
| 2. Advocaat | b. agave |
| 3. Ale | c. almond |
| 4. Amaretto | d. anise |
| 5. Baijiu | e. apple |
| 6. Bourbon | f. barley |
| 7. Chambord | g. cherry |
| 8. Chartreuse | h. corn |
| 9. Cider | i. egg |
| 10. Gin | j. honey |
| 11. Kvass | k. juniper |
| 12. Limoncello | l. lemon |
| 13. Maraschino | m. orange |
| 14. Mead | n. raspberry |
| 15. Nocino | o. rice |
| 16. Ouzo | p. rye |
| 17. Rum | q. sorghum |
| 18. Sake | r. sugarcane |
| 19. Tequila | s. walnut |
| 20. Triple sec | t. wormwood |

5 F: 1, 1, 2, 3, 5, 8, 13, 21...
 L: 1, 3, 4, 7, 11, 18, 29, 47...
 F×L: 1, 3, 8, 21, 55, 144, 377, 987...
 Fibonacci (F) and Lucas (L) get a next term by adding the previous two. What is the rule for F×L?

		5	3				
	1						
2	3	9	4	6	5	8	
	7						
		2	6		8	5	
							1
		7	9	5	1	6	3
							9
					7	2	

6 Which is larger, the light area or the dark area?

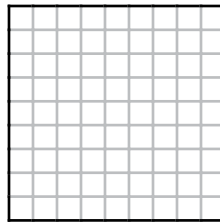


1 The letters of some phrases can be arranged to make two animals, such as "summer vacation" = "marmoset + vicuna", or "bratmobile" = "mole + rabbit." Rearrange the letters of each of the below phrases to make two well known animals.

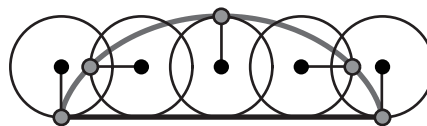
- | | |
|-----------|------------------|
| seesaw | hired goons |
| XY plane | pack animal |
| hay rake | moneymaker |
| pillbug | parole board |
| war chest | Mornay sauce |
| town gate | morning breath |
| Lois Lane | health inspector |

2 Roulette will double a bet made on red or black, 20/38ths of the time. If you want a 99% chance of being \$1 ahead after a series of bets, how much should you be prepared to lose, 1% of the time? How should you bet?

3 In a tiled rectangle, a fault line is a straight line all the way across so that the figure could be divided into two rectangles. An old puzzle is to tile a 5x6 rectangle with 1x2 dominoes without fault lines. Tile the 9x9 square below with 1x3 trominos without any fault lines.



4 In 1599, Galileo called the arc formed by a point on a moving circle a cycloid, and determined that the area under this curve was equal to three circles. He hardly used any math, though. How did he do it?

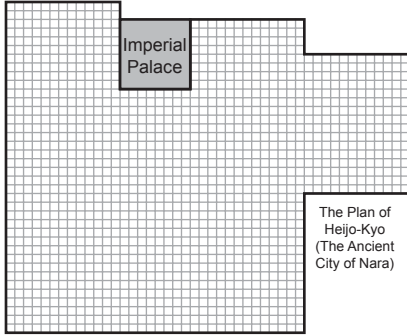


				7	4	9
						5
3	9	2	8	5		6
7				4		3
2		8	6	9		1
6		3				8
4		1	2	8	9	7
9						
1	3	4				

5 What do these words have in common: angel, devil, sun, star, clown, balloon, drum, trumpet, guitar, box, ribbon, rabbit, cat, lion, parrot, dog, hog, goat, horse, zebra, unicorn, dragon, silver, gold, rock, stone, bone, butter, jelly, ghost, candle, lantern, doctor, surgeon, knife, sword, damsel, hag, king, and lady.

by Ed Pegg Jr

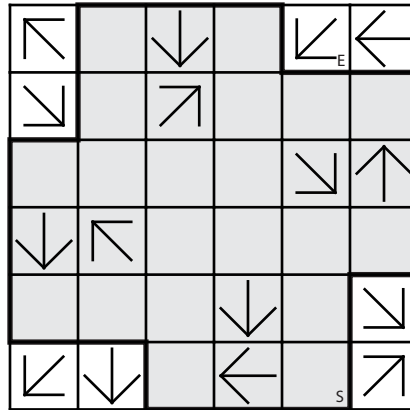
- 1 The Plan of Heijo-Kyo (The Ancient City of Nara), is shown below, with the lines indicating streets and alleys. The Imperial Palace is one square. Divide the rest of the city into the fewest number of squares.



- 2 What do these words and names have in common: bar, cur, Einstein, franc, gall, German, Nobel, sod, Thor, titan, zircon?
- 3 Arrange seven points so that for any three chosen, two of them will 1 cm apart.

- 4 Match each delicious item with the primary producer. 1) Côte d'Ivoire 2) India 3) Indonesia 4) Madagascar 5) United States. a) cinnamon b) cocoa c) ginger d) strawberry e) vanilla.

- 5 A chess king starts at S and ends at E, eventually moving once from every square in the shaded region. The arrows indicate direction of movement. No arrow is repeated in any row or column.



1	2						
3	4						
			2	6			
5	6		3	9			
7	8				6	4	
			6	8		9	1
			3	5			
						2	7
						6	8

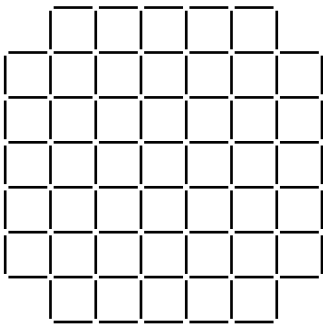
- 6 Add math symbols to 1, 7, and 7 to make 5.
- 7 In which figure is the sum of circle diameters the greatest?



by Ed Pegg Jr

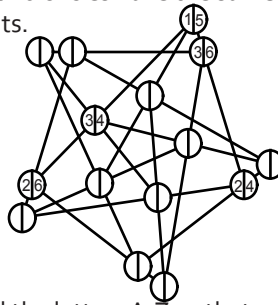
- 1 Match these symbols to their names: 1 ÷, 2 /, 3 |, 4 †, 5 \. a) pipe, b) oblique, c) obelus, d) virgule, e) solidus.

- 2 There are over 500 rectangles in the cornerless square below. First, determine how many rectangles there are, then remove 30 of the toothpicks so that none of the rectangles remain.



- 3 Who are these people, and where might they be found: George Spelvin, Alan Smithee, Tommie Atkins, and Richard Roe.

- 4 Fill in the circles so that each line has the numbers 1 to 6, and so that no two circles have the same two digits.



- 5 Add the letters A-Z so that 10 words read across and down. Across clues: like some broth, uneasiness, offers too much, search for water, Cairo locale, fox, Prague resident, uneven.

		E		Y
			L	
C		O		
			S	E
E		Y		
			E	
C		E		
	E			Y

3					
5	1	9			
		6	7	2	
			9	7	2
6					4
4	5	8			
		2	6	7	
			1	2	5
					3

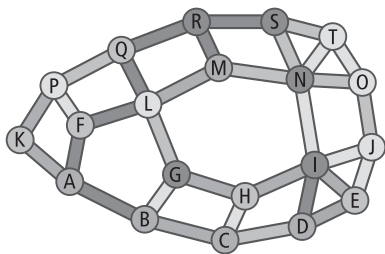
- 6 On the Rhind Papyrus in 1680 BC, Ahmes mentioned that some of the math problems he been tasked to copy were really old, even back then. Here's one of them: A quantity added to a quarter of that quantity become 15. What is the quantity?

by Ed Pegg Jr

1 A to D are individuals who either consistently tell lies or tell the truth. Who is lying?

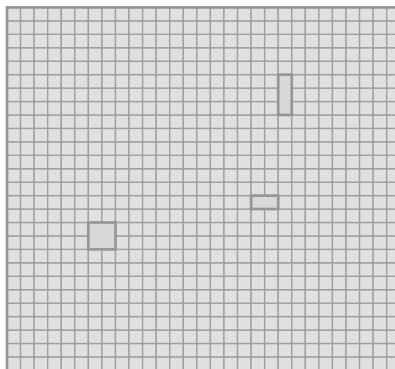
- A: C tells lies. C: D tells the truth.
 B: D tells lies. D: Either A or C tells lies.

2 A boy and girl stand on the disk marked D. They decide that if 1 of them stays on a disk, the other can walk on paths of that color. For example, while the girl stays on the blue D, the boy could take the blue paths to E and then to I. As he stays on the red I, the girl can take the red path from D to I. That set of moves would be DD-DE-DI-II. Find a set that gets the boy and girl from DD (both on D) to TT (both on T).



by Ed Pegg Jr.

3 Fill in the remainder of the 29×27 rectangle below with 12 more rectangles, all with area 63, 64, 65 or 66.



4 10 words of 8 letters each overlap one another by 3 letters. The overlaps are CAN, AIR, WAY, COM, ARM, UND, BAL, INT, AME, STA. Put these into the blanks below, with the last blank copying the first blank.

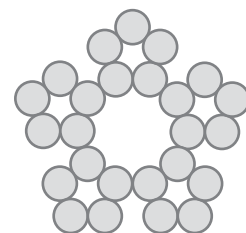
___FR___RI___NI___LI___IR___PO
 ___ER___PO___ER___CH___

LATIN SQUARE

Fill in the blank squares in the puzzle below so that the numbers 1–9 are contained in each small grid as well as in each column and row of the entire grid.

		1	2	3	4	5		
			6	7	8			
				9				
2								7
6	8						1	2
7								5
				6				
			1	2	3			
		3	8	5	9	4		

5 How many straight lines of 4 coins are there?



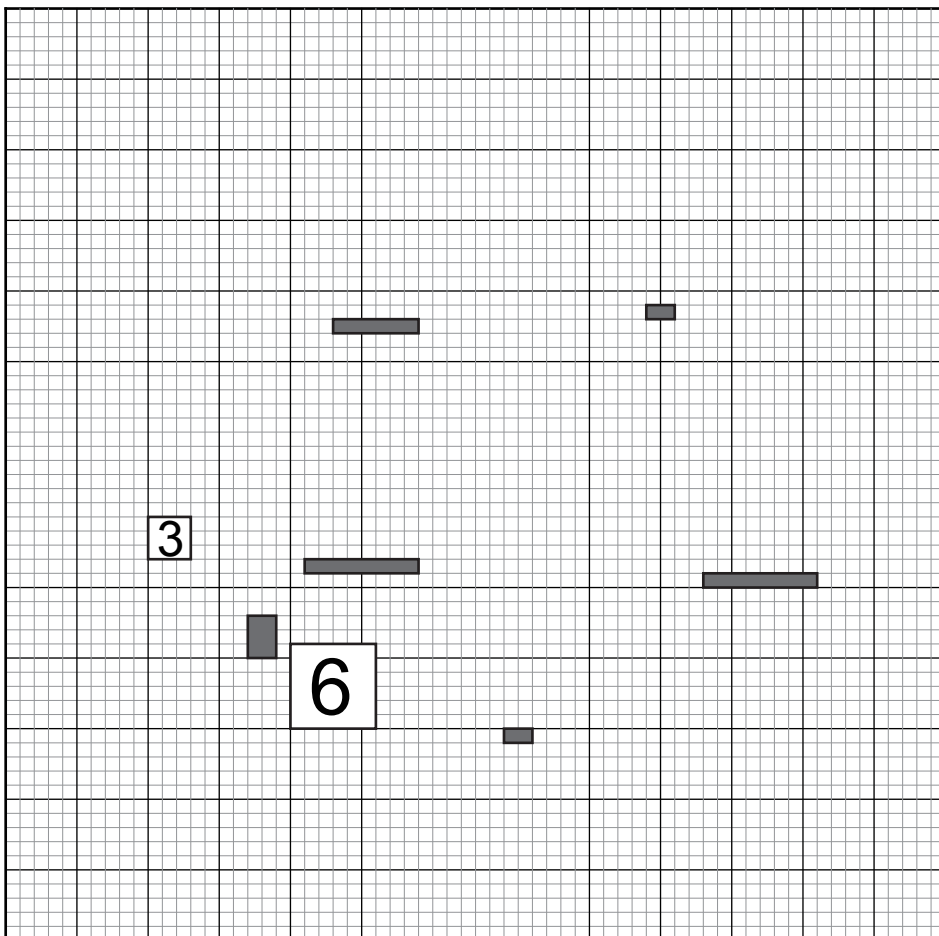
For several years, I've been doing the puzzle column for the Japan Airlines in-flight magazine, Skyward. I hope you've enjoyed seeing them.

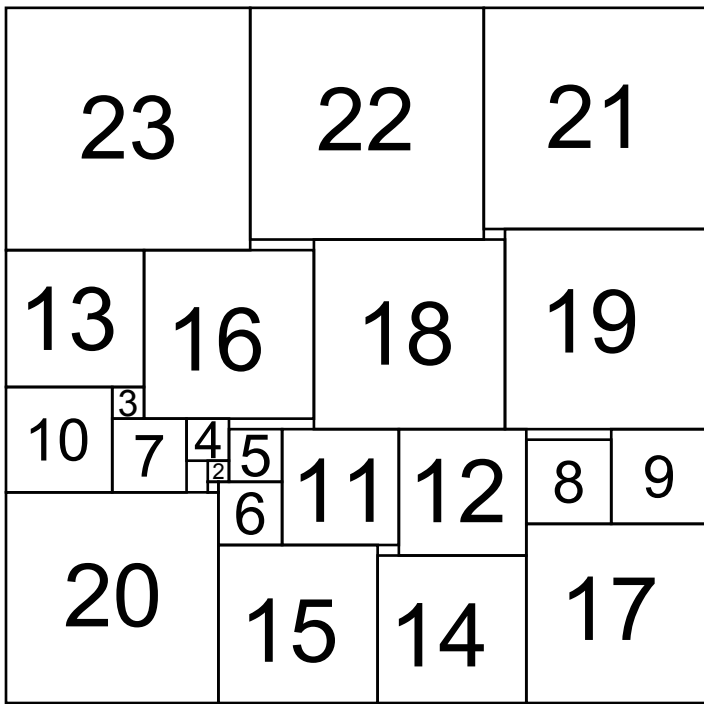
Ed Pegg Jr

- www.mathpuzzle.com
- demonstrations.wolfram.com
- mathworld.wolfram.com
- numb3rs.wolfram.com
- www.recmath.org

ed@mathpuzzle.com

For more than 30 years, it was believed that squares with sides 1-23 could not be packed in a 66×66 square. Shigeyoshi Kamakura solved it in 2004. Match his feat. Squares with side 3 and 6 have been placed for you, along with all the holes in the solution. Every fifth line from the edges is darkened as a solving aid.





SOLUTIONS

1. With the colony doubling in area every 2 weeks, it will take 20 such expansions — 2^{20} — to exceed 1 square kilometer (1,000,000 m²): $2^{20} = 1,048,576$. 20×2 weeks = 40 weeks.

2. DGHEH, DCFED, ABGHA, DABCFGD and DAHEFGBCD.

3.

T	W	O			
T	H	G	I	E	
X	R	U	O	F	
I	E	N	I	N	
S	E	V	E	N	
Z	E	R	O	T	

4. $25 + 64 = 89$

5. Stomachache, amalgamated, antioxidant, cardboard, phenomenon, Chihuahua, highlight, mathematics, monotonous, oscilloscope, downtown, philosophical, racetrack, anticlimactic, tormentor, underground, scuttiebutt.

Latin Square

1	3	8	7	6	5	4	9	2
2	5	6	8	9	4	3	1	7
9	4	7	3	2	1	6	5	8
4	7	1	9	5	6	8	2	3
5	2	3	1	8	7	9	4	6
6	8	9	4	3	2	1	7	5
8	6	4	2	7	9	5	3	1
7	9	5	6	1	3	2	8	4
3	1	2	5	4	8	7	6	9

1. OSCARS, ITALIC, LADIDA, ELEVEN, DETEST

2. Al spent \$5, Bob \$145, Cal \$55, Dot \$115 and Ed \$95.

3. I'm 43 years old. Either way, 252 is the result.

4. 35 ways: (A, A, A, A), (A, A, A, B), ... (D, D, D, D).

5. The answer is below.

6.

7. $(1 \times 7) - (2 \times 3) = 1$; $(2 \times 7) - (1 \times 5) = 9$; and $(3 \times 9) - (4 \times 5) = 7$. So, in the 4th box: $(5 \times 7) - (9 \times 4) = 6$.

Latin Square

2	6	1	8	9	3	5	7	4
4	3	5	1	7	2	6	9	8
9	8	7	4	5	6	1	2	3
6	2	9	3	4	1	8	5	7
1	5	8	9	2	7	4	3	6
3	7	4	5	6	8	2	1	9
8	4	2	7	3	5	9	6	1
7	9	6	2	1	4	3	8	5
5	1	3	6	8	9	7	4	2

1. There are many solutions. One example is:

2.

3. a, Po; b, Nd; c, Mg; d, W; e, Zr; f, Rh; g, Bi; h, Ti; i, Am; j, Ce.

4. They all have a latitude of 35°; Canberra is 35°S, the others 35°N.

5. 39 needs 3 steps, 77 needs 4 steps.

Latin Square

8	2	3	5	6	1	9	4	7
5	6	7	9	8	4	2	1	3
1	4	9	7	2	3	8	5	6
2	5	4	8	3	7	1	6	9
7	9	1	6	4	2	3	8	5
6	3	8	1	5	9	7	2	4
9	1	2	4	7	6	5	3	8
3	8	6	2	9	5	4	7	1
4	7	5	3	1	8	6	9	2

1.

2. The city bird, from a noisier environment, will have a louder song.

3.

Item	Created in	Removed by
Red blood cells	bone marrow	spleen
Gastric acid	stomach	duodenum
Insulin	pancreas	liver
Renin	kidneys	liver
Urea	liver	kidneys

4. Ed was last.

5. His sister.

6.

Latin Square

1	8	6	7	5	9	2	3	4
2	7	4	3	1	8	6	9	5
3	9	5	4	2	6	8	1	7
8	4	1	2	9	3	5	7	6
7	5	3	1	6	4	9	2	8
9	6	2	5	8	7	3	4	1
6	2	7	9	4	5	1	8	3
4	1	8	6	3	2	7	5	9
5	3	9	8	7	1	4	6	2

1.

2.

3. Each has a double letter, which can be removed to make a new word: coerce, candle, fuel, receive, boom, string, seated.

4. One man's meat is another man's poison.

5.

6. The one with the wavy sword: it cannot be pulled from the scabbard.

Latin Square

4	8	3	5	1	6	2	9	7
6	7	1	2	8	9	5	3	4
2	5	9	4	7	3	6	1	8
7	4	2	9	3	8	1	6	5
9	1	6	7	2	5	8	4	3
5	3	8	1	6	4	7	2	9
1	9	5	6	4	7	3	8	2
8	2	4	3	5	1	9	7	6
3	6	7	8	9	2	4	5	1

1. West faces north, East faces south, South faces east, North faces west.

2. All the digits can be connected with no lines crossing. For example:

3. Lotion, motion, notion, ocean, potion.

4.

P	N	M	R
O	S	A	E
I	T	H	N
			O

5. Each vowel can be changed to any other vowel to produce a word.

6. Remove 3 coins to win.

7. In 3 dimensions, make an octahedron.

Latin Square

6	3	1	9	4	8	5	2	7
5	2	4	1	3	7	9	8	6
9	8	7	6	5	2	3	4	1
3	5	9	8	6	1	4	7	2
1	7	2	3	9	4	8	6	5
8	4	6	7	2	5	1	3	9
4	6	3	5	7	9	2	1	8
7	9	8	2	1	3	6	5	4
2	1	5	4	8	6	7	9	3

1. Dudeney, Yoshigahara, Gardner, Shortz, Loyd.

2.

3. Both bags weigh 40 kg.

4.

5.

	Day 1	Day 2	Day 3	Day 4	Day 5
9 a.m.	ARCO	GPR	MICG	INCR	GOIN
1 p.m.	EFGH	NUJA	FOOH	ELPP	JOBH
3 p.m.	IKL	CELO	PLNA	AKGO	AMIE
5 p.m.	MNOP	DKNH	NKBE	ILMF	CFPK

6. 1st weighing: weigh 5 against 5. If balanced, they are all true; then weigh 6 of those against the remaining 6 to determine whether these are heavier or lighter. If the 1st weighing is imbalanced, the remaining 6 are true — weigh 5 of those against the coins in the heavier pan.

Latin Square

1	3	6	9	2	8	5	4	7
4	8	2	5	6	7	1	3	9
5	7	9	3	4	1	2	6	8
3	4	8	1	7	6	9	2	5
6	1	7	2	5	9	4	8	3
9	2	5	8	3	4	6	7	1
8	5	4	7	9	2	3	1	6
2	9	1	6	8	3	7	5	4
7	6	3	4	1	5	8	9	2

1. 3 arcs.

2.

3. Alchemy is the only word that does not contain the name of an element (tin, argon, iron, nickel, lead).

4. 16 pieces. The sequence is 2, 4, 7, 11, 16, 22.

5. Basics, cabaret, toenail, deviate, shambles, misdemeanor, protagonist, miscalculation.

6.

7. Biochemistry, compensatory.

Latin Square

6	1	7	9	8	3	5	4	2
8	2	9	4	5	6	1	7	3
5	4	3	7	2	1	8	6	9
2	6	1	8	3	4	9	5	7
3	9	8	5	6	7	2	1	4
7	5	4	1	9	2	3	8	6
9	7	6	3	1	5	4	2	8
4	8	5	2	7	9	6	3	1
1	3	2	6	4	8	7	9	5

1. 1, gold hawk; 2, white horse; 3, gray wolf; 4, red cat; 5, silver fox.

2. $777 \div 7 = 111$.

3. 1 e, 2 f, 3 c, 4 j, 5 i, 6 g, 7 d, 8 b, 9 h, 10 a.

4. 25 cm.

5. All are parts of a horse.

6. The angles A + B and C are equal.

Latin Square

6	8	2	4	1	9	7	5	3
7	3	1	6	8	5	9	4	2
4	9	5	3	2	7	6	8	1
1	2	9	5	6	4	8	3	7
5	6	3	2	7	8	1	9	4
8	7	4	1	9	3	2	6	5
2	4	6	8	5	1	3	7	9
9	5	8	7	3	2	4	1	6
3	1	7	9	4	6	5	2	8

1.

2. The merchant earned \$19,998 on items worth \$11,110 and \$9,090. Total loss was \$202.

3. $\frac{5}{24} + \frac{7}{68} + \frac{9}{12} = 1$.

4. Callifonium, infomercial; centenarian, maintenance; groundwater, undergrowth; guttersnipe, pretentious; kitchenware, windcheater; necessarily, screenplays; parentheses, spreadsheet.

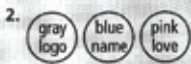
5. $\frac{5}{24} + \frac{7}{68} + \frac{9}{12} = 1$.

6. 728,163,549.

Latin Square

7	3	1	8	5	6	4	2	9
5	6	4	3	2	9	8	7	1
2	9	8	1	4	7	5	3	6
1	8	3	2	6	5	7	9	4
4	7	6	9	3	1	2	8	5
9	2	5	7	8	4	1	6	3
8	5	9	6	1	2	3	4	7
3	1	7	4	9	8	6	5	2
6	4	2	5	7	3	9	1	8

1. All have the same area.



3. The minimum overlap among the 3 variables is 25%.

4. $273 = \frac{3}{728} = \frac{163}{326} = \frac{1}{2}$

5. 784590.
6. All are composites, with each constituent meaning both the same as the other and the entire word: pussy = cat = pussycat; quag = mire = quagmire; taxi = cab = taxicab; bath = tub = bathtub.

7. Weigh the pile of nails into 2 halves, then repeat on 1 of the halves. 1 of these halves weighs 3 kilos. Take the rest.

Latin Square

5 7 4 6 1 9 2 3 8
9 3 2 4 8 7 5 1 6
1 6 8 5 3 2 7 9 4
7 4 6 2 9 1 3 8 5
3 5 9 7 4 8 1 6 2
2 8 1 3 6 5 4 7 9
4 1 7 8 2 6 9 5 3
8 2 5 9 7 3 6 4 1
6 9 3 1 5 4 8 2 7



2. domineered
Adobe Premiere
freedom of mind
mixed-breed dog
Great Pyramid of Giza

Latin Square

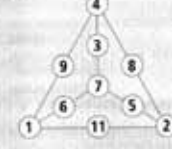
1 2 5 4 8 6 7 9 3
3 8 9 5 7 1 4 6 2
7 6 4 2 3 9 8 1 5
8 1 2 9 5 7 3 4 6
5 7 6 3 1 4 2 8 9
4 9 3 8 6 2 1 5 7
2 5 8 1 9 3 6 7 4
6 4 1 7 2 5 9 3 8
9 3 7 6 4 8 5 2 1

3. Each has a single-letter symbol on the New York Stock Exchange: C, F, K, M, Q, R, S, T, V and X.

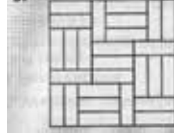
4. 24 shots.



5.



1. a. ass, ewe; b. ape, lynx; c. hare, yak; d. bull, pig; e. cat, shrew; f. goat, newt; g. lion, seal; h. dingo, horse; i. alpaca, mink; j. mare, monkey; k. boat, leopard; l. canary, mouse; m. bighorn, marten; n. elephant, ostrich
2. Bet 1, then 2, 4, 8, 16, 32, 64 and 128 on red (or black). Stop as soon as you win and you'll have \$1. If you have bad luck, you will lose \$255.

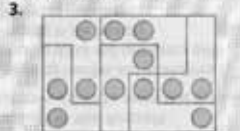


4. He cut the figures out of sheet metal and weighed them.
5. Each word can have "fish" added to it: angelfish, balloonfish, butterfish, clownfish, etc.

Latin Square

2 5 1 6 3 7 4 9 8
6 8 7 9 4 1 3 5 2
4 3 9 2 8 5 1 6 7
9 7 8 5 1 4 2 3 6
3 2 5 8 6 9 7 1 4
1 6 4 3 7 2 5 8 9
5 4 6 1 2 8 9 7 3
8 9 2 7 5 3 6 4 1
7 1 3 4 9 6 8 2 5

1. Intercept, carpenter, epicenter, recipient, perfection, apprentice, predicament.
2. 32 triangles.

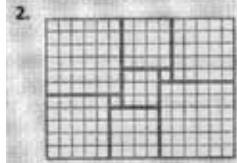
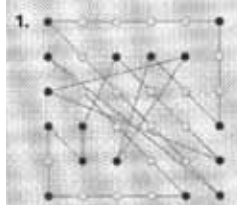


4. Both lotteries have the same odds: 1 in 3,003.
5. Sumo wrestling.

6. No. The 5-digit number breaks down to a single-figure digit sum of 8 (3 + 5 = 8). All square numbers break down to digit sums of 1, 4, 7 or 9.

Latin Square

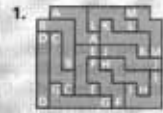
7 3 4 1 9 5 2 6 8
1 9 2 6 8 7 4 5 3
6 8 5 3 4 2 1 7 9
3 5 7 8 2 1 6 9 4
8 4 1 9 3 6 5 2 7
9 2 6 5 7 4 3 8 1
2 1 9 7 5 3 8 4 6
5 6 8 4 1 9 7 3 2
4 7 3 2 6 8 9 1 5



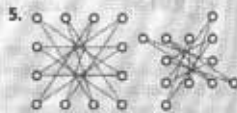
4. vivid detail
insecticidal
minimalistic
middle initial
veni vidi vici
Dixieland music
Cecil B. DeMille
advice columnist
well-diversified
medieval medicine
5. An hourglass.
6. It seems to turn counterclockwise.

Latin Square

9 5 4 2 8 7 3 6 1
8 3 2 6 1 9 5 4 7
1 6 7 3 5 4 2 8 9
4 8 3 5 7 2 1 9 6
5 7 6 1 9 3 8 2 4
2 9 1 4 6 8 7 3 5
7 4 8 9 3 5 6 1 2
6 2 5 8 4 1 9 7 3
3 1 9 7 2 6 4 5 8



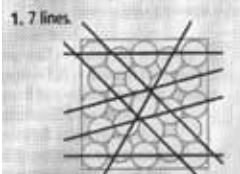
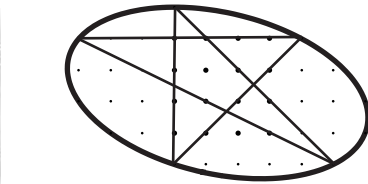
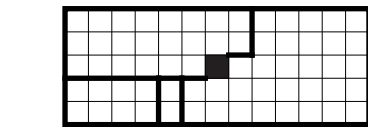
2. Film noir, with LMNO. Understudy, with RSTU.
3. Dmitri buys 3 drinks for All.
4. Here are 44: anemic, cinema, iceman, manche, amice, amine, anime, chain, chime, china, chine, hance, hemic, hemin, manic, mince, niche, ache, acme, acne, ahem, amen, cain, came, cane, chai, chia, chin, cine, each, hame, inch, mace, main, mane, mean, mica, mice, mien, miss, mine, name, nema, nice.



Latin Square

2 1 3 8 6 4 5 9 7
7 9 6 2 1 5 4 3 8
8 5 4 9 7 3 2 1 6
1 2 8 3 5 6 9 7 4
4 7 5 1 9 2 8 6 3
6 3 9 7 4 8 1 5 2
5 6 7 4 8 1 3 2 9
3 8 1 6 2 9 7 4 5
9 4 2 5 3 7 6 8 1

3. 1 (13 pieces) + 1 (8 pieces) + 2 (5 pieces) + 3 (3 pieces) + 5 (2 pieces) + 13 (1 piece) = 25 instances.



2. If the digits are grouped as 1099, 1198, 1297, etc., this results in 45 digit sums of 19 each. 45 x 19 = 855; 8 + 5 + 5 = 18; 1 + 8 = 9.
3. a: 2; b: 8; c: 15; d: 3; e: 7; f: 6; g: 12; h: 14; i: 10; j: 5; k: 13; l: 11; m: 9; n: 4; o: 1.

4. Fill the 3-liter container from the 6-liter one, then pour 3 liters from the 5-liter container into the 6-liter one.
5. He is helium gas.

Latin Square

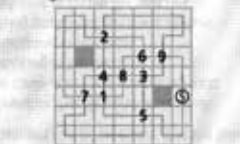
8 2 6 5 7 1 9 3 4
7 4 5 9 3 6 2 1 8
1 3 9 4 8 2 6 7 5
9 1 7 3 5 8 4 2 6
5 6 3 7 2 4 8 9 1
4 8 2 6 1 9 7 5 3
2 9 1 8 4 5 3 6 7
3 5 4 2 6 7 1 8 9
6 7 8 1 9 3 5 4 2

347936483574692582762519181

9 4 6 15
7 14 12 1
16 5 3 10
2 11 13 8

A feather
It is 8:24. The hour hand can be exactly on a second mark only when the second hand is at 12.

1. Neat fact: with any self-crossing loop, you can label every other crossing in order.



5. All their past tenses rhyme: bought, brought, caught, fought, sought, taught, thought.
6. $\frac{1}{26} + \frac{5}{28} = \frac{1}{29}$. $\frac{1}{32} + \frac{1}{36} = \frac{1}{48}$.

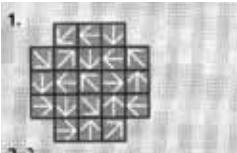
Latin Square

1 3 6 5 7 9 8 4 2
7 2 4 1 8 3 6 9 5
9 5 8 2 6 4 3 1 7
2 8 3 9 1 7 5 6 4
4 6 1 3 5 2 9 7 8
5 9 7 8 4 6 1 2 3
8 7 5 4 9 1 2 3 6
3 4 9 6 2 5 7 8 1
6 1 2 7 3 8 4 5 9

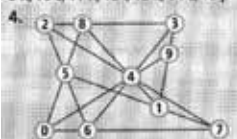
2. None of the letters has curves.



4. Get his instant count, then have him leave the room. Remove a few paper clips, mix the rest, then call him back and get a new instant count. The difference should be the number of clips you hold.



2. 2
1
0
3. 1 o; 2 g; 3 e; 4 b; 5 f; 6 d; 7 t; 8 m; 9 h; 10 c; 11 r; 12 t; 13 k; 14 a; 15 j.

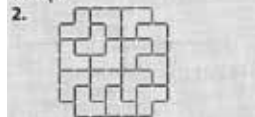


5. Let the small and big circles have areas S and B, respectively. B = 4S. The total area covered by the small circles can be calculated by either 4S - 4red or 4S - 4purple. Therefore, the red area must equal the purple area.

Latin Square

7 8 5 3 1 2 4 6 9
6 1 4 7 8 9 3 2 5
2 3 9 4 6 5 8 7 1
5 7 3 1 2 4 9 8 6
1 9 2 6 7 8 5 4 3
8 4 6 5 9 3 7 1 2
4 2 7 9 5 1 6 3 8
3 5 8 2 4 6 1 9 7
9 6 1 8 3 7 2 5 4

1. ÷ obelus, / solidus, | pipe, † dagger, ‡ oblique.



3. They are fake names, for an actor, director, soldier and plaintiff.

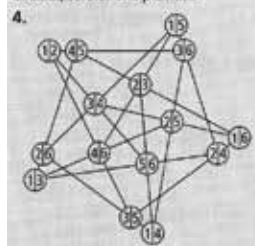
BEEFY
QUALM
CLOYS
DOUSE
EGYPT
VIXEN
CZECH
JERKY

Classic Puzzle

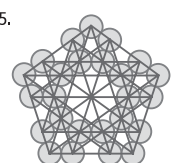
12.

Latin Square

2 3 7 1 8 5 9 6 4
6 5 1 9 3 4 8 7 2
4 8 9 6 7 2 3 1 5
3 1 8 4 5 9 7 2 6
9 6 2 7 1 3 5 4 8
7 4 5 8 2 6 1 9 3
5 9 3 2 6 7 4 8 1
8 7 6 3 4 1 2 5 9
1 2 4 5 9 8 6 3 7



5. 25.



Latin Square

9 7 1 2 3 4 5 6 8
3 5 2 6 7 8 1 9 4
8 4 6 5 9 1 7 2 3
2 1 5 3 8 6 9 4 7
6 8 9 7 4 5 3 1 2
7 3 4 9 1 2 6 8 5
5 9 8 4 6 7 2 3 1
4 6 7 1 2 3 8 5 9
1 2 3 8 5 9 4 6 7

4. airframe, American, cannibal, ballista, stairway, waypoint, intercom, compound, underarm, armchair.