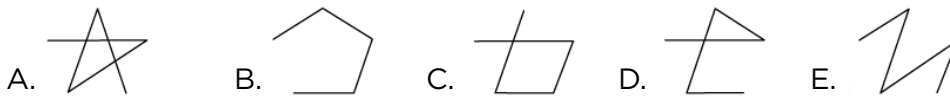
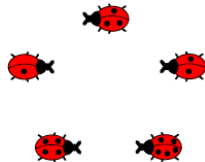
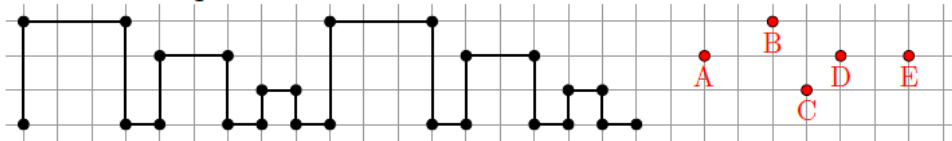


Level 1

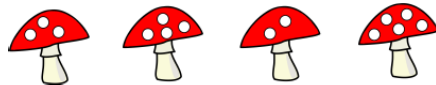
1. Alice draws a figure connecting all the ladybugs in the order of increasing number of dots. She starts with the ladybug with one dot. Which figure will she get?



2. Peter drew a pattern twice, as in the picture. Which point will he reach when he draws the third pattern?



- A. A B. B C. C D. D E. E
3. The number of dwarfs that can fit under a mushroom is equal to the number of dots on the mushroom cap. The picture below shows one side of each mushroom. The number of dots on the other side is the same. If 30 dwarfs are seeking shelter from the rain, how many dwarfs will get wet?



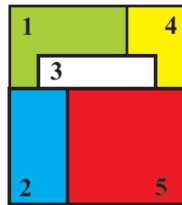
- A. 2 B. 3 C. 4 D. 5 E. 6

4. At the entrance of the zoo there are 12 children in line. Lucy is the 7th from the front and Sam is the second from the back. How many children are there between Lucy and Sam in the line?



- A. 2 B. 3 C. 4 D. 5 E. 6

5. Five square cards are stacked on a table, as shown. The cards are removed one by one from the top of the stack. In what order are the cards removed?



- A. 5-2-3-1-4 B. 5-2-3-4-1 C. 4-5-2-3-1 D. 5-3-2-1-4
E. 1-2-3-4-5

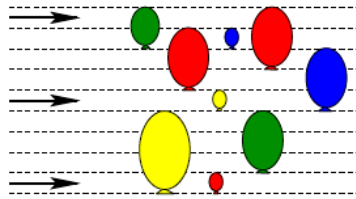
6. Peter chose a square of four cells in the table so that the sum of the four numbers inside the square is greater than 63. Which of the following numbers must be in the chosen square?

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

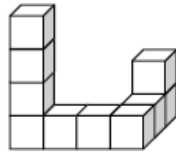
- A. 14 B. 15 C. 17 D. 18 E. 20

Level 2

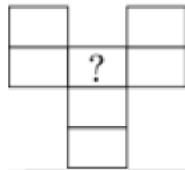
1. The picture shows 3 arrows that are flying and 9 balloons that can't move. When an arrow hits a balloon, the balloon pops, and the arrow keeps flying in the same direction. How many balloons will be hit by the flying arrows?



- A. 2 B. 3 C. 4 D. 5 E. 6
2. Toby glues 10 cubes together to make the structure shown below. He paints the whole structure, even the bottom. How many cubes are painted on exactly 4 of their faces?

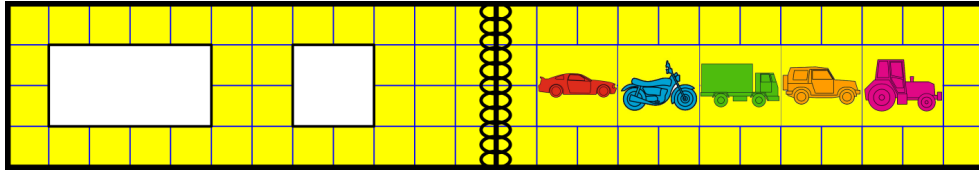


- A. 6 B. 7 C. 8 D. 9 E. 10
3. Leon wants to write the numbers from 1 to 7 in the grid shown. Two consecutive numbers cannot be written in two neighboring cells. Neighboring cells are those that meet at the edge or at a corner. What numbers can he write in the cell marked with the question mark?



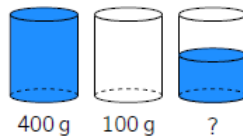
- A. all seven numbers
 B. all of the odd numbers
 C. all of the even numbers
 D. only the number 4
 E. only the numbers 1 or 7

4. There are two holes in the cover of a book. When the book is open, it looks like this:

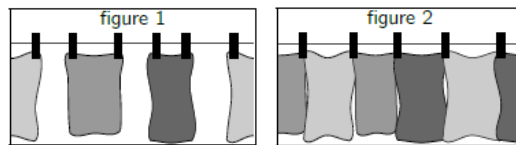


Which pictures does Olaf see through the holes when he closes the book?

- A. B. C.
 D. E.
5. A glass full of water weighs 400 grams. An empty glass weighs 100 grams. How many grams does a glass half-full with water weigh?



- A. 150 B. 200 C. 225 D. 250 E. 300
6. Emil started to hang up towels using two pegs for each towel as shown in figure 1. He realized that he would have not enough pegs and began to hang up the towels as shown in figure 2. Altogether, he hung up 35 towels and used 58 pegs. How many towels did Emil hang up in the way shown in figure 1?



- A. 12 B. 13 C. 21 D. 22 E. 23

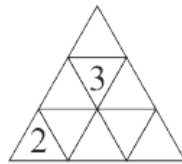
Level 3

1. Alice subtracted two 2-digit numbers. Then she painted two cells. What is the sum of the two digits in the painted cells?



$$\cancel{3} - \cancel{2} = 25$$

- A. 8 B. 9 C. 12 D. 13 E. 15
2. Emily wants to enter a number into each cell of the triangular table. The sum of the numbers in any two cells with a common edge must be the same. She has already entered two numbers. What is the sum of all the numbers in the table?



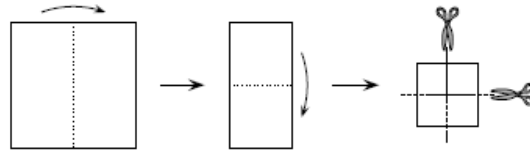
- A. 18 B. 20 C. 21 D. 22 E. impossible to determine
3. Five balls, A, B, C, D, and E, weigh 30 g, 50 g, 50 g, 50 g, and 80 g each, not necessarily in that order. Which ball weighs 30 g?



- A. A B. B C. C D. D E. E
4. The sum of the dots on opposite faces of an ordinary die is equal to 7. Which of the following could be an ordinary die?



5. Bridget folded a square sheet of paper twice, and then cut it twice as shown in the figure. How many pieces of paper did she get?



- A. 6 B. 8 C. 9 D. 12 E. 16

6. Robert made 5 statements A to E. Exactly one of these statements is false. Which one?

- A. My son Basil has 3 sisters.
- B. My daughter Ann has two brothers.
- C. My daughter Ann has 2 sisters.
- D. My son Basil has 2 brothers.
- E. I have 5 children.

Level 4

1. When the letters of the word MAMA are written vertically above one another, the word has a vertical line of symmetry. Which of these words also has a vertical line of symmetry when written in the same way?



- A. ROOT B. BOOM C. BOOT
 D. LOOT E. TOOT

2. A rectangle is divided into 40 identical squares. The rectangle contains more than one row of squares. Andrew found the middle row of squares and colored it in. How many squares did he not color?

- A. 20 B. 30 C. 32 D. 35 E. 39

3. Domino tiles are said to be arranged correctly if the number of dots at the ends that touch are the same. Peter laid six dominoes in a line as shown in the diagram. He can make a move by either swapping the position of any two dominoes or by rotating one domino. What is the smallest number of moves he needs to make to arrange all the tiles correctly?



- A. 1 B. 2 C. 3 D. 4 E. It is impossible to do.

4. Three rings are linked as shown in the diagram. Which of the following diagrams also shows the three rings linked in the same way?

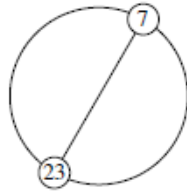


- A. 
 B. 
 C. 
 D. 
 E. 

5. Julio has two cylindrical candles with different heights and diameters. The first candle lasts 6 hours, while the second candle lasts 8 hours. He lit both candles at the same time and three hours later both candles were the same height. What was the ratio of their original heights?

A. 4:3 B. 8:5 C. 5:4 D. 3:5 E. 7:3

6. The integers from 1 to n , inclusive, are equally spaced in order around a circle. The diameter through the position of the integer 7 also goes through the position of 23, as shown. What is the value of n ?



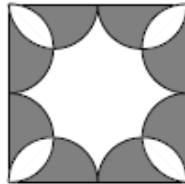
A. 30 B. 32 C. 34 D. 36 E. 3

Level 5

1. In my family each child has at least two brothers and at least one sister. What is the smallest possible number of children in my family?

A. 3 B. 4 C. 5 D. 6 E. 7

2. Eight congruent semicircles are drawn inside a square with a side length of 4. What is the area of the non-shaded part of the square?



A. 2π B. 8 C. $6 + \pi$ D. $3\pi - 2$ E. 3π

3. Diana draws a rectangular grid of 12 squares on squared paper. Some of the squares are painted black. In each blank square she writes the number of black squares that share a side with it. The figure shows an example. Now she does the same in a rectangular grid with 2018 squares. What is the maximum value that she can obtain as the result of the sum of all the numbers in the grid?

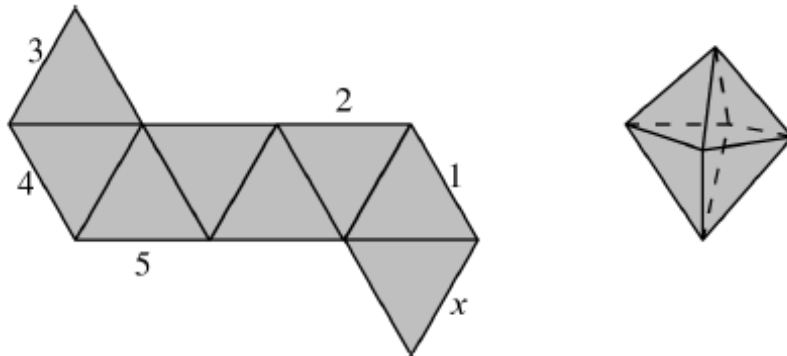
1		2	1
0	3		
1		2	1

A. 1262 B. 2016 C. 2018 D. 3025 E. 3027

4. A model train takes exactly 1 minute and 11 seconds for each round on a course. How long does it take for six rounds?

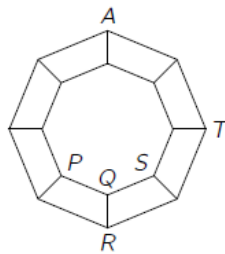
A. 6 minutes 56 seconds B. 7 minutes 6 seconds C. 7 minutes 16 seconds
 D. 7 minutes 26 seconds E. 7 minutes 36 seconds

5. The diagram shows a net of an octahedron. When this net is folded to form the octahedron, which of the labeled line segments will coincide with the line segment marked with the x ?



- A. 1 B. 2 C. 3 D. 4 E. 5

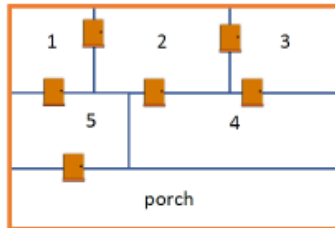
6. A graph consists of 16 vertices and some edges that connect them, as shown in the picture. An ant is now at the vertex labeled A . In each move, it can walk from one vertex to any neighboring vertex crawling along a connecting edge. At which of the vertices labeled P , Q , R , S , T can the ant be after 2019 moves?



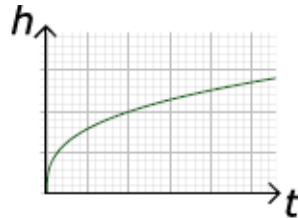
- A. only P , R , or S ; not Q and T B. only P , R , S , or T ; not Q C. only Q
D. only T E. All of the vertices are possible.

Level 6

1. The figure shows the floor plan of Renate's house. Renate enters her house from the porch and walks through each door exactly once. In which room does she end up?



- A. 1 B. 2 C. 3 D. 4 E. 5
2. A vase is filled up to the top with water, at a constant rate. The graph shows the height h of the water as a function of time t .



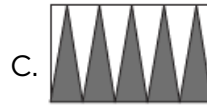
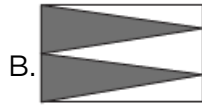
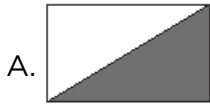
Which of the following can be the shape of the vase?



3. There are 40% more girls than boys in a class. How many pupils are in this class if the probability that a two-person delegation selected at random consists of a girl and a boy equals $1/2$?

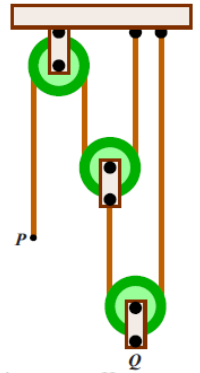
- A. 20 B. 24 C. 36
 D. 38 E. This situation is not possible

4. A rectangle has been shaded in five different ways as shown. In which diagram does the shaded part have the largest area?

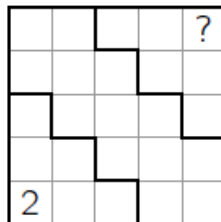


5. The system shown consists of three pulleys with vertical sections of rope between them. The end P is moved down 24 centimeters. How many centimeters does point Q move up?

- A. 24 B. 12 C. 8 D. 6 E. $24/5$



6. The square shown is filled with numbers in such a way that each row and each column contains the numbers 1, 2, 3, 4, and 5 exactly once. Moreover, the sum of the numbers in each of the three regions within bold borders is equal. What number is in the upper-right corner on the square with the question mark?



- A. 1 B. 2 C. 3 D. 4 E. 5