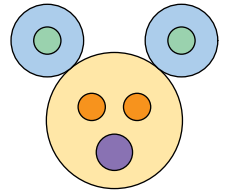


## Pre-Ecolier

3 points

1 (Myanmar). How many circles are there in the figure?

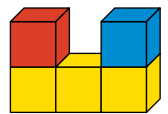
- (A) 5  
(B) 6  
(C) 7  
(D) 8  
(E) 9



SOLUTION: There are 3 outer circles and 5 inner circles, so in total 8 circles.

2 (Myanmar). The picture shows 5 cubes viewed from the front. What is the view from above?

- (A) (B) (C) (D) (E)



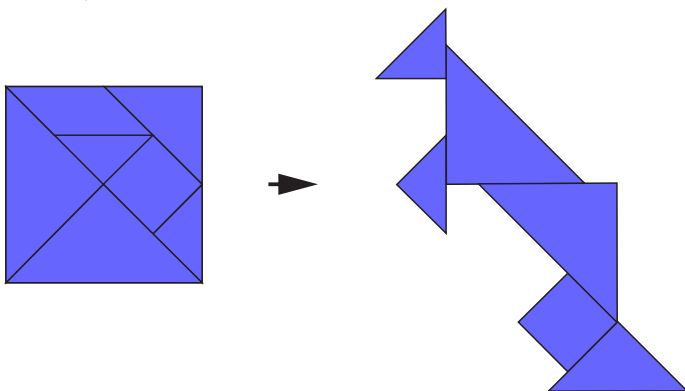
SOLUTION: The cubes on the top are left red and blue right. The middle doesn't have a cube on the top, so the colour you see is yellow. Therefore, from left to right, we see red, yellow, blue.

3 (Croatia). Each bowl contains four numbered balls, as shown. In which bowl is the sum of all the numbers largest?

- (A) (B) (C) (D) (E)

SOLUTION: Notice that in each bowl there is a ball with number 9, 7 and 4. So the sum depends only on the fourth number and is the largest in A.

4 (China). Mr Beaver rearranges the pieces to make a kangaroo figure.

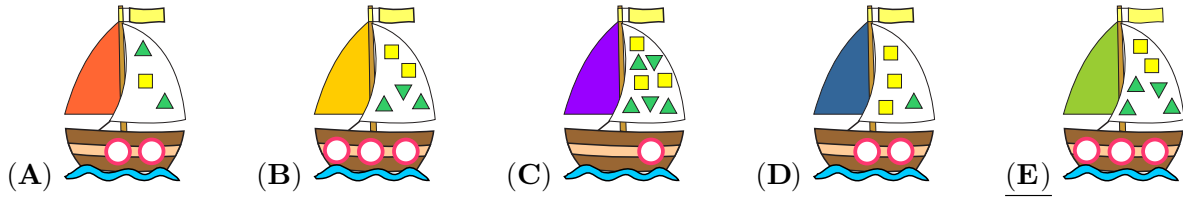


Which piece is missing?

- (A) (B) (C) (D) (E)

SOLUTION: The kangaroo is made of 5 triangles and 1 square. So Mr Beaver did not use the piece with number 3.

**5 (Slovakia).** My boat has more than 1 circle. It also has 2 more triangles than squares. Which boat is mine?



**SOLUTION:** My boat has more than 1 circle, therefore we reject the answer C. Now we count how many triangles and squares are on the sails. In A there are 2 triangles and 1 square (1 more triangle than square) - not the correct answer. In B there are 3 triangles and 2 squares (1 more triangle than squares) - not the correct answer. In D there are 1 triangle and 3 squares (2 less triangle than squares) - not the correct answer. In E there are 4 triangles and 2 squares (2 more triangle than squares), so this is my boat.

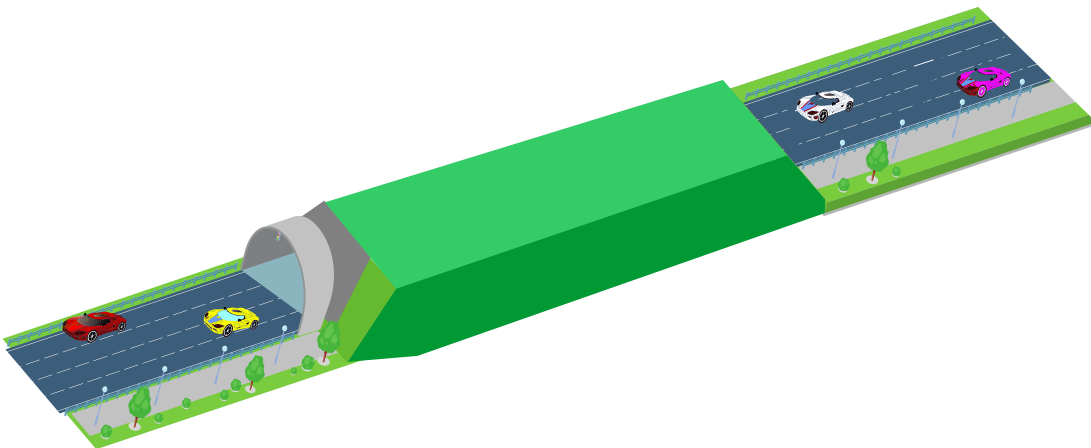
**6 (France).** This is my grandfather's birthday cake. A large candle stands for 10 years and a small one for 1 year. How old is my grandfather?

- (A) 65 (B) 66  
(C) 76 (D) 77  
(E) 78



**SOLUTION:** There are 7 big candles and 6 small ones on the cake. So grandfather is  $7 \times 10 + 6 \times 1 = 76$  years old.

**7 (Montenegro).** Pablo puts 10 toy cars on this racetrack. How many cars are in the tunnel?

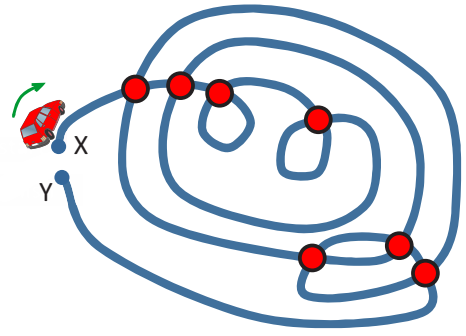


- (A) 5 (B) 6 (C) 7 (D) 8 (E) 9

**SOLUTION:** There are in total 10 cars on the racetrack. We can see 4 cars that are not in the tunnel, so  $10 - 4 = 6$  cars are in the tunnel.

**8 (Greece).** Steven drives from X to Y. At each crossing, he stops before going straight ahead. In total, how many times does he stop at a crossing?

- (A) 11  
(B) 12  
(C) 13  
(D) 14  
(E) 15

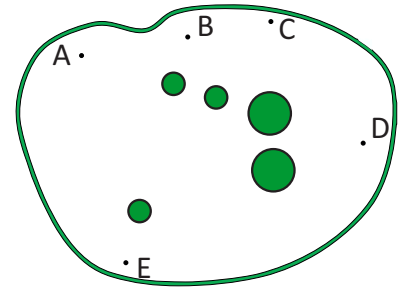


**SOLUTION:** The car will stop each time it reaches a red dot, and then continue straight ahead. All of the crossings will be passed exactly twice. In total, the car will stop 14 times.

4 points

**9 (Greece).** There are 5 trees in a park. A beaver can see only two of the trees because all the others are hidden behind other trees. At which of the marked points is the beaver standing?

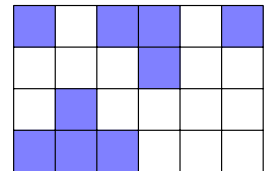
- (A) at A  
(B) at B  
(C) at C  
(D) at D  
(E) at E



**SOLUTION:** From any point except D, the beaver can see more than 2 trees. From the point D, the two big trees block all rest from view.

**10 (Canada).** There are 24 squares in the picture. Suchit has coloured some of the squares. How many more squares need to be coloured so that half of the squares are coloured?

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5



**SOLUTION:** Half the number of squares is  $24/2 = 12$ , and 9 squares are already coloured. Therefore, 3 more need to be coloured.

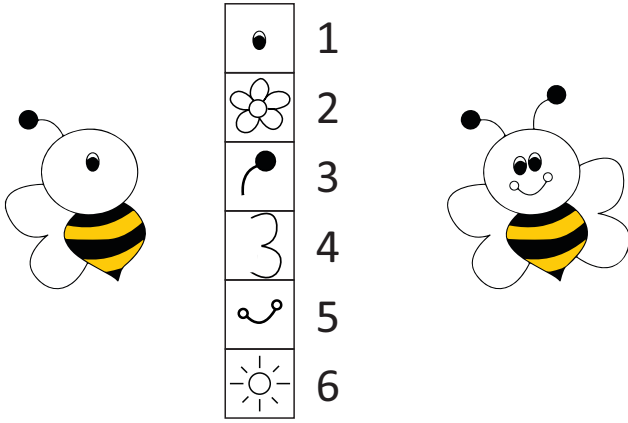
**11 (Denmark).** The two tokens with the question mark have the same number. What is each missing number so that the sum is 18?

$$\textcircled{10} + \textcircled{?} + \textcircled{?} + \textcircled{2} = 18$$

- (A) 1  
(B) 2  
(C) 3  
(D) 4  
(E) 5

**SOLUTION:** We can add  $10 + 2 = 12$ . Then  $18 - 12 = 6$  and so the number on each token is 3.

**12 (Iran).** Raha wants to finish the bee on the left according to the model on the right.



Raha needs to win points to unlock parts of the bee. How many points does she need to win to complete the bee?

- (A) 9 (B) 10 (C) 11 (D) 12 (E) 13

SOLUTION: The missing part of the bee are 1 eye, 1 antenna, 1 wing, 1 mouth. Altogether these need  $1 + 3 + 4 + 5 = 13$  points.

**13 (Russia).** The table has 30 boxes. After painting the boxes in row 3, row 6, column C and column D, how many boxes will be not painted?

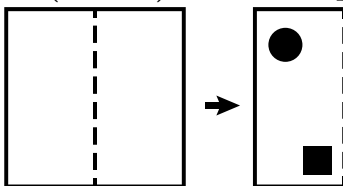
|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 |   |   |   |   |   |
| 2 |   |   |   |   |   |
| 3 |   |   |   |   |   |
| 4 |   |   |   |   |   |
| 5 |   |   |   |   |   |
| 6 |   |   |   |   |   |

- (A) 8 (B) 10 (C) 12 (D) 18 (E) 22

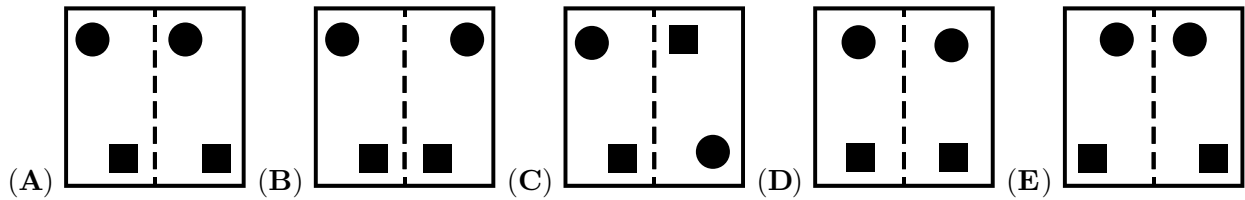
SOLUTION: We can mark the squares and count how many are left.

|   | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 |   |   |   |   |   |
| 2 |   |   |   |   |   |
| 3 |   |   |   |   |   |
| 4 |   |   |   |   |   |
| 5 |   |   |   |   |   |
| 6 |   |   |   |   |   |

**14 (Russia).** A sheet of paper is folded in half. Square and round holes are punched.



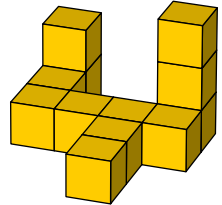
How does the sheet look after it is unfolded again?



SOLUTION: After unfolding, the two square holes will be closer together than the two round holes.

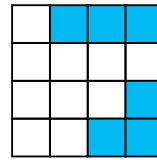
**15 (Greece).** A student made the shape shown using 12 cubes. He put one drop of glue between any two cubes that share a common face. How many drops of glue did he use?

- (A) 8 (B) 9 (C) 10  
(D) 11 (E) 12

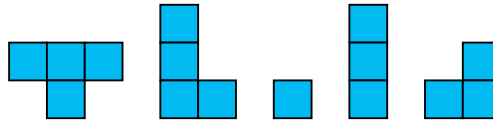


SOLUTION: By counting carefully, we see that there must be 11 drops of glue.

**16 (Poland).** Max wants to complete the puzzle shown.



He has 5 different pieces shown.



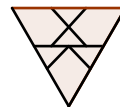
Which pieces does he have to use to complete the puzzle?

- (A) [1x4 strip, 2x2 square, 3x1 L-shape] (B) [1x4 strip, 2x2 square, 3x1 L-shape] (C) [1x4 strip, 2x2 square, 3x1 L-shape]  
(D) [1x4 strip, 2x2 square, 3x1 L-shape] (E) [1x4 strip, 2x2 square, 3x1 L-shape]

SOLUTION: He has to use 1 at the top, 4 at the right and 5 at the bottom.

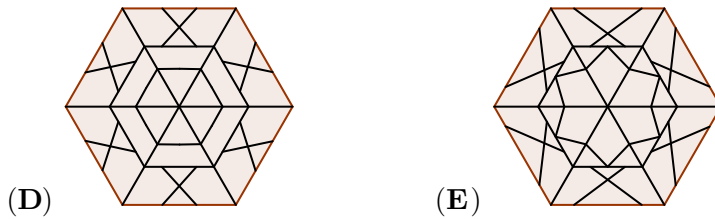
5 points

**17 (Denmark).** Elvis has 6 identical triangles like this.



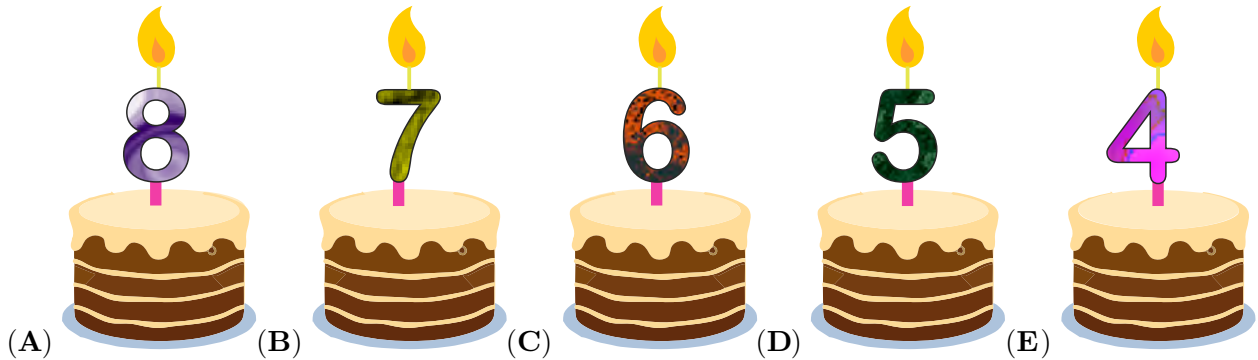
Which of the following pictures

- (A) [A hexagon composed of 12 small triangles, with 6 of them shaded light gray.] (B) [A hexagon composed of 12 small triangles, with 6 of them shaded light gray.] (C) [A hexagon composed of 12 small triangles, with 6 of them shaded light gray.]



SOLUTION: We only need to compare one piece of each option and notice that only A is correct.

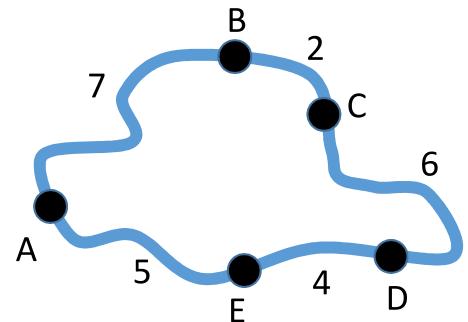
**18 (Poland).** Five children share a birthday and each child has their own cake. Lea is two years older than Jose, but one year younger than Ali. Vittorio is the youngest. Which is Sarah's cake?



SOLUTION: The five children are aged 8, 7, 6, 5 and 4. Vittorio is the youngest so he is 4. Lea is two years older than Jose and one year younger than Ali, so Jose is 5, Lea is 7 and Ali is 8 years old. So the fifth child, Sarah, is 6 years old.

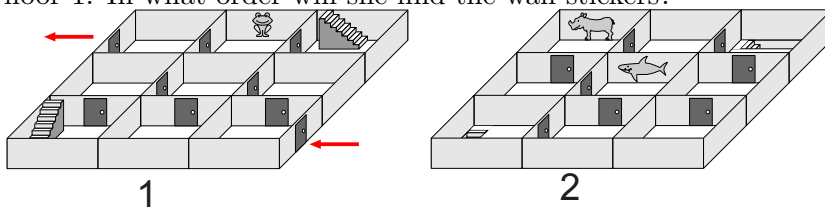
**19 (Greece).** The map shows five villages A, B, C, D and E, and the distances in kilometres between them. Only two villages are the same distance apart no matter which route you choose. Which are these two villages?

- (A) B and E (B) B and D  
(C) C and E (D) A and C  
(E) A and D



SOLUTION: The whole circuit is  $7 + 2 + 6 + 4 + 5 = 24$  km. So if the two distances are equal, each must be 12 km. So we are looking for a village that there is another one at a distance 12 km going, say, clockwise. From A, we have B is distance 7 km (too little), C is  $7 + 2 = 9$  km (also too little) and D is  $7 + 2 + 6 = 15$  km (too much). So A is not one of the villages. Try B. We have distances 2,  $2 + 6 = 8$ ,  $2 + 6 + 4 = 12$  km. This is acceptable, so the two villages are B and E. One can verify that the other direction joining B and E is 12 km, as before. One can also verify that the other cases, such as from C or D, do not give us distance 12 km to any village, so they are not the answer.

**20 (Belgium).** Sam walks through a two-storey maze from the entrance to the exit, both located at floor 1. In what order will she find the wall stickers?



- (A) (B) (C) (D) (E)

SOLUTION: There is only one route from the entrance to the exit. In order, Sam will see the shark,

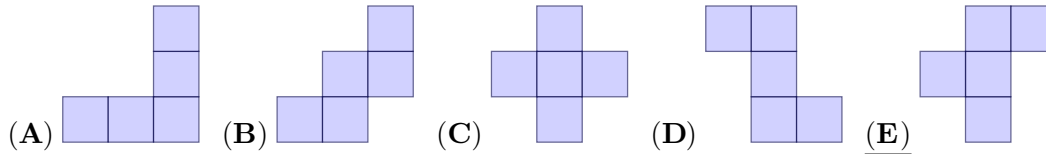
rhinoceros and frog.

**21 (Slovakia).** Emma finished third in a solo dance competition. There were three dancers between her and last place. In total, how many dancers took part in the competition?

- (A) 4                      (B) 5                      (C) 6                      (D) 7                      (E) 8

SOLUTION: Emma finished third, so there are at least 3 dancers in the competition, including her. After Emma we have 3 more dancers and the dancer who is in last place. In total that will be  $3 + 3 + 1 = 7$  dancers in the competition.

**22 (Canada).** Malik places one of the five pieces on the grid. He cannot rotate or flip the pieces. Which piece should he use to cover the numbers with the largest sum?



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

SOLUTION: All pieces cover five squares on the grid. The five largest numbers are 9, 8, 7, 6 and 5. Only one piece will cover all of these.

**23 (Lithuania).** Three frogs live in a pond. Each night, one of the frogs sings a song to the other two. After 9 nights, one of the frogs had sung 2 times. Another frog had listened to 5 songs. How many songs had the third frog listened to?

- (A) 7                      (B) 6                      (C) 5                      (D) 4                      (E) 3

SOLUTION: On each of the 9 nights, one frog sang, the other two listened. The first frog sang 2 times; the second frog listened 5 times. This means the third frog sang 3 times, and so it must have listened  $9 - 3 = 6$  times.

**24 (Hong Kong).** Digits 1, 1, 2 and 3 are printed on four different cards. Three cards are laid out to make a subtraction, as shown in the picture. How many different results can be obtained?



- (A) 6                      (B) 8                      (C) 10                      (D) 12                      (E) 24

SOLUTION: With digits 1, 1, 2 and 3 we can make expressions:  $11 - 2 = 9$ ,  $11 - 3 = 8$ ,  $12 - 1 = 11$ ,  $12 - 3 = 9$ ,  $13 - 1 = 12$ ,  $13 - 2 = 11$ ,  $21 - 1 = 20$ ,  $21 - 3 = 18$ ,  $23 - 1 = 22$ ,  $31 - 1 = 30$ ,  $31 - 2 = 28$ ,  $32 - 1 = 31$ . There are 12 expressions but only 10 unique results.