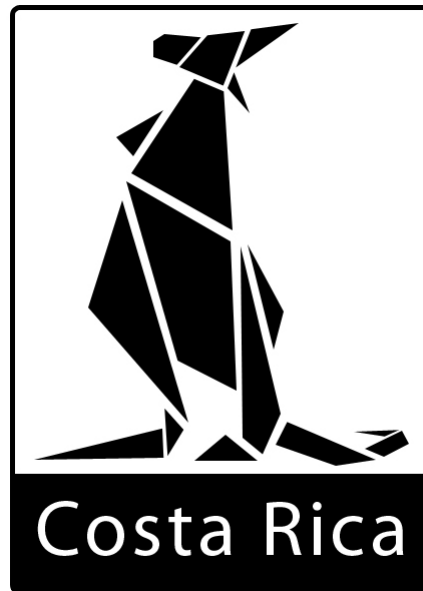# Canguro Matemático Costarricense
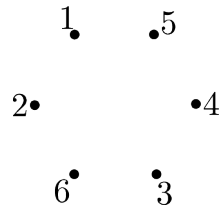


Costa Rica

Benjamin Test
Fifth grade

Name of the student:_____

Name of the institution:_____

Kangourou Sans Frontières
Costa Rica 2022

3 points

**1.** Six points are numbered as shown.

1  .5

2•    •4

6   3

Kirsten draws two triangles, one by joining the even numbered points and one by joining the odd numbered points, and colours the inside of one of the triangles red and the inside of the other green. Which of the five options shows the picture Kirsten draws?
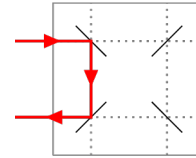
(**A**)    (**B**)    (**C**)    (**D**)

(**E**)
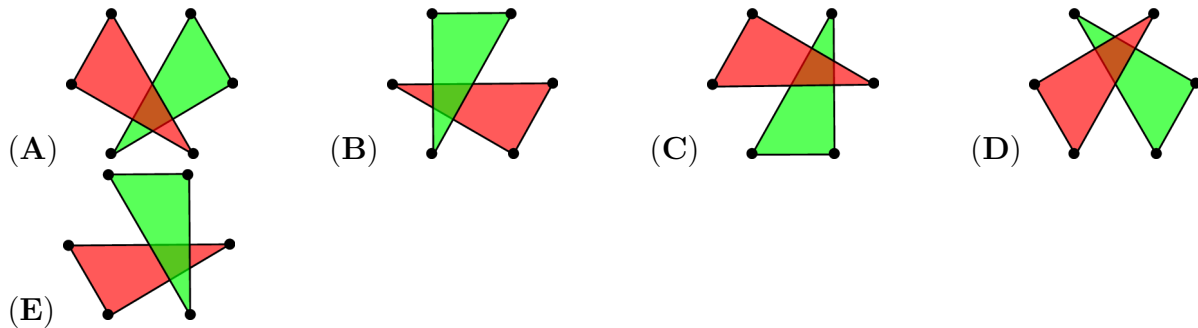
**2.** Eileen rowed around five buoys, as shown.
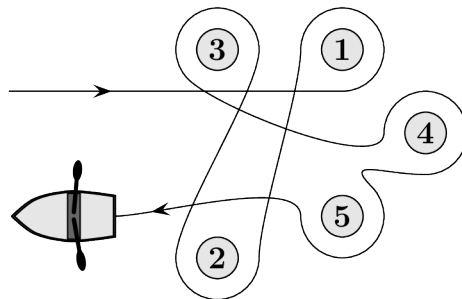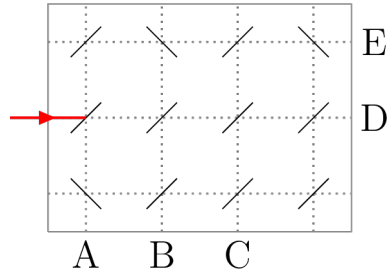
Which buoys did Eileen row around in an anticlockwise direction?

(**A**) 1 and 4              (**B**) 2, 3 and 5
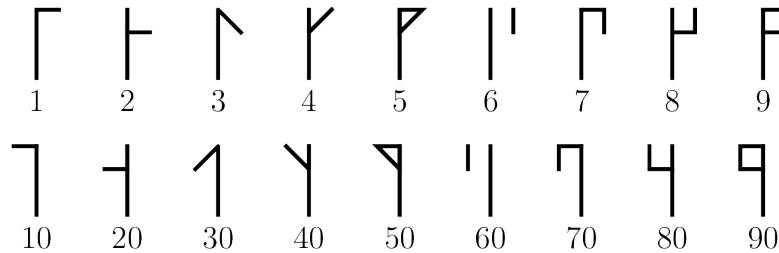(**C**) 2 and 3              (**D**) 1, 4 and 5
(**E**) 1 and 3

**3.** Laser beams reflect in mirrors in the way shown in the picture.

At which letter will this laser beam end?

(**A**) A (**B**) B (**C**) C (**D**) D (**E**) E

**4.** Cistercian numerals were used in the early thirteenth century. Any integer from 1 to 99 can be represented by a single glyph formed by combining two of the glyphs shown below.

The glyph for 24 looks like , the glyph for 81 looks like and the glyph for 93 looks like . What does the glyph for 45 look like?

(**A**) (**B**) (**C**) (**D**) (**E**)

**5.** Marbles are sold in packages of 5, 10 or 25. Tom buys exactly 95 marbles. What is the minimum number of packages he could buy?

(**A**) 4 (**B**) 5 (**C**) 7 (**D**) 8 (**E**) 10

**6.** ABCD is a square with side-length 10 cm.



What is the area of the shaded part?

(**A**) 40 cm²        (**B**) 45 cm²        (**C**) 50 cm²

(**D**) 55 cm²        (**E**) 60 cm²

**7.** In the garage shown in the picture, vehicles can only move forward or backward but cannot turn.
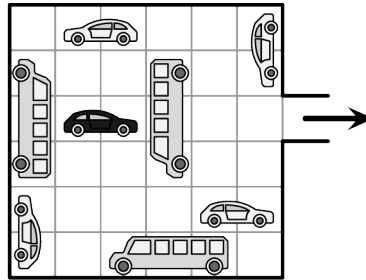


    What is the smallest number of vehicles that have to move for the black car to be able to exit the garage?

(**A**) 2                      (**B**) 3

(**C**) 4                      (**D**) 5
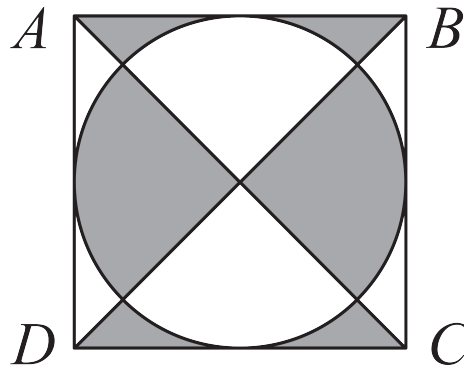
(**E**) 6

**8.** Giulia has one long string of spaghetti she needs to make smaller. Every time she breaks one piece of spaghetti, it becomes three pieces as shown in the picture.
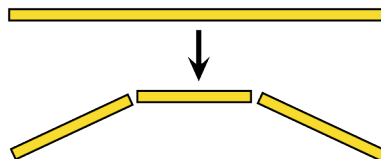


Which of the following numbers of pieces could she not get?

(**A**) 13        (**B**) 17        (**C**) 20        (**D**) 23        (**E**) 25

**9.** Three football teams participate in a sports tournament. Each team plays the other two teams exactly once. In each game, the winner gets 3 points and the loser doesn't get any points. If the game finishes in a draw, each team gets 1 point.
At the end of the tournament, which number of points is it **impossible** for any team to have?

(**A**) 1        (**B**) 2        (**C**) 4        (**D**) 5        (**E**) 6
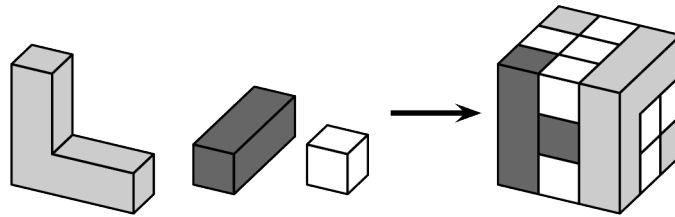
**10.** The cube in the picture is built from the three kinds of wooden blocks shown.



How many white wooden blocks are used?

(**A**) 8        (**B**) 11        (**C**) 13        (**D**) 16        (**E**) 19

 

4 points

**11.** Bodil rearranges the 7 pieces shown to get the smallest possible 12 digit number.
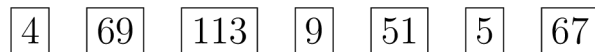


What are the last 3 digits of this number?

(**A**) 699        (**B**) 113        (**C**) 551        (**D**) 967        (**E**) 459

**12.**
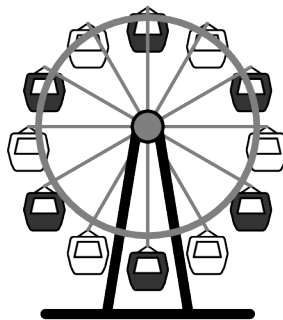


Which of the following fractions of a whole turn should the Ferris wheel turn to bring a white pod to the top?

(**A**) $\dfrac{1}{2}$      (**B**) $\dfrac{1}{3}$      (**C**) $\dfrac{1}{6}$      (**D**) $\dfrac{1}{12}$      (**E**) $\dfrac{5}{6}$

**13.** Rob the Builder has a brick whose shortest side is 4 cm. He uses several such bricks to build the cube shown.



What are the dimensions, in cm, of his brick?

(**A**) $4 \times 6 \times 12$      (**B**) $4 \times 6 \times 16$      (**C**) $4 \times 8 \times 12$
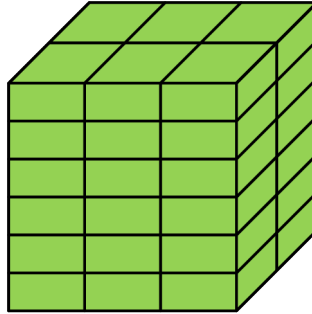(**D**) $4 \times 8 \times 16$      (**E**) $4 \times 12 \times 16$

**14.** The number plate of Kangy's car fell off. He put it back upside down but luckily this didn't make any difference. Which one of the following could be Kangy's number plate?

(**A**) 04 NSN 40      (**B**) 60 HOH 09      (**C**) 80 BNB 08
(**D**) 03 HNH 30      (**E**) 08 XBX 80

**15.** In the grid, the same number is hidden under the same colour square.
To the right of each row, the sum of the numbers hidden under the squares in that row is given.
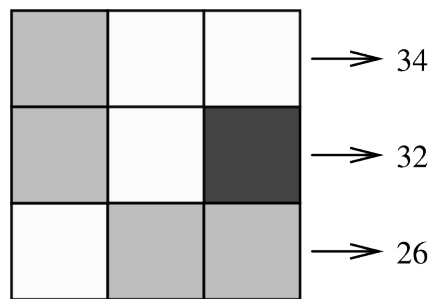


Which number is hidden under the black square?

(**A**) 6      (**B**) 8      (**C**) 10
(**D**) 12      (**E**) 14

**16.** Five children ate some plums.
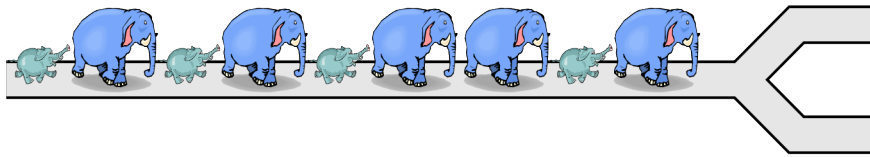Lauren ate two plums more than Sophie.
Betty ate three plums fewer than Lauren.
Claire ate one plum more than Betty and three plums fewer than Alice.
Which two girls ate the same number of plums?

(**A**) Claire and Lauren.     (**B**) Claire and Sophie.     (**C**) Lauren and Alice.

(**D**) Sophie and Alice.     (**E**) Alice and Betty.

**17.** Five big elephants and four small ones are walking along a path, as shown.



When they reach the junction, each elephant turns either to the left or to the right. Which of the following cannot be the situation after they all pass the junction?
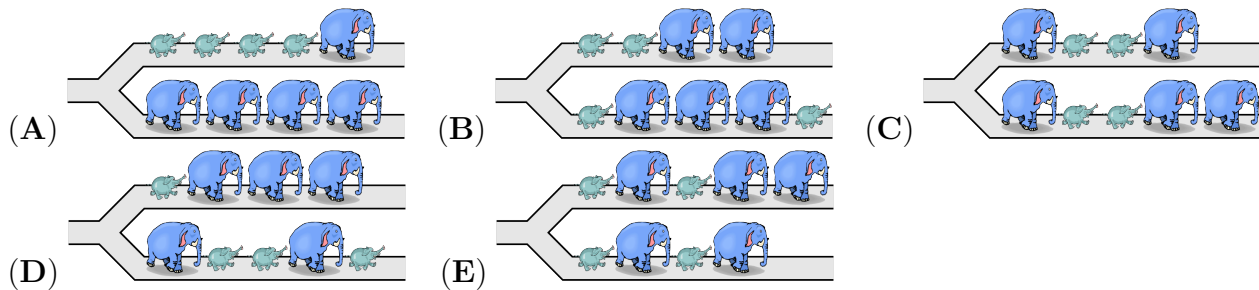


**18.** Clara starts with number 12 and follows the arrows using the rules shown in the picture on the left.
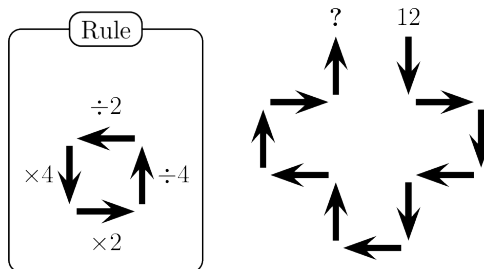


What number will she finish with?

(**A**) 3      (**B**) 6      (**C**) 12      (**D**) 24      (**E**) 48

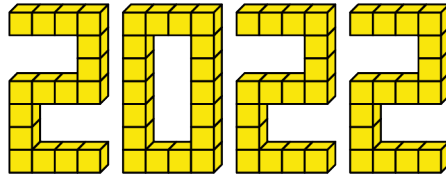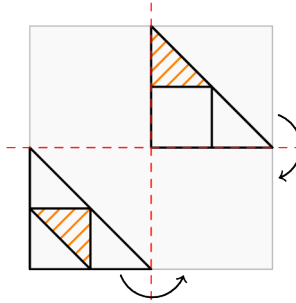**19.** Masoud and his friends built the number 2022 with 66 cubes, as shown in the picture.



They painted the whole surface of the structure yellow. How many of the cubes have exactly 4 faces painted?

(**A**) 16      (**B**) 30      (**C**) 46      (**D**) 54      (**E**) 60

**20.** The picture shows a piece of transparent paper with a design drawn on it. The paper is then folded twice, as shown.



What would be seen on the folded paper?



(**A**)      (**B**)      (**C**)      (**D**)      (**E**)

5 points

**21.** The area of the square is 100 cm².



10 cm

10 cm
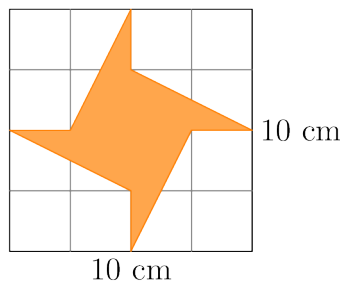
What is the area of the shaded figure?

(**A**) 20 cm²      (**B**) 25 cm²      (**C**) 30 cm²      (**D**) 35 cm²      (**E**) 40 cm²

**22.** The year 2022 is a special year because the digit 2 appears three times. This is the third time Eva the tortoise has lived through such a year with three identical digits. What is the youngest Eva could be by the end of 2022?

(**A**) 18 (**B**) 20 (**C**) 22 (**D**) 23 (**E**) 134

**23.** Andrew wants to complete the picture so that each row, each column and each set of four circles connected by line segments contains the four numbers 1, 2, 3, and 4.
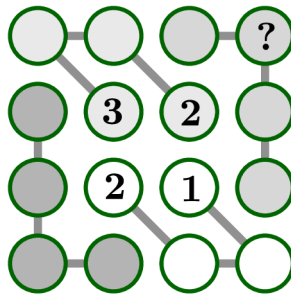


What number should he write in the circle containing the question mark?

(**A**) 1 (**B**) 2 (**C**) 3 (**D**) 4
(**E**) It cannot be determined

**24.** Lisa has 4 dogs. Each of the 4 dogs weighs an integer number of kg. No two of them weigh the same. Their total weight is 60 kg. The second heaviest dog weighs 28 kg. How heavy is the third heaviest dog?

(**A**) 2 kg (**B**) 3 kg (**C**) 4 kg (**D**) 5 kg (**E**) 6 kg

**25.** Jessi writes the seven numbers 3, 4, 5, 6, 7, 8, and 9 in the circles in the picture so that the sums of the three numbers on each line are equal.
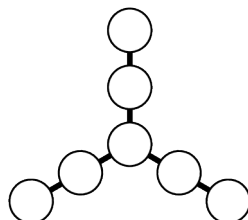


What is the largest possible sum of three numbers on a line that Jessi can get?

(**A**) 28 (**B**) 18 (**C**) 22 (**D**) 16 (**E**) 20

**26.** The numbers 3, 4, 5, 6 and 7 are to be placed in the five circles below so that the number inside each triangle is the product of the three numbers on its vertices.
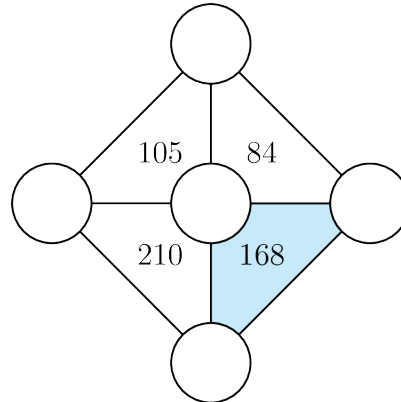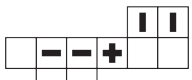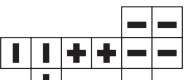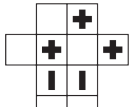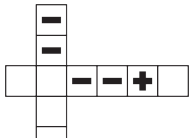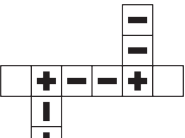


What is the sum of the three numbers on the vertices of the coloured triangle?

(**A**) 12 (**B**) 14 (**C**) 15 (**D**) 17 (**E**) 18

**27.** The four villages A, B, C and D lie along a road in that order. The distance between neighbouring villages is 10 km. There are 10 students who live in village A, 20 students who live in village B, 30 students who live in village C and 40 students who live in village D. The villagers want to build a school so that the total distance travelled by the students when going to school is as small as possible. Where should they build the school?

(**A**) in A                     (**B**) in B
(**C**) in the middle between B and C          (**D**) in C
(**E**) in D

**28.** Which of the following nets cannot be folded into the solid ?
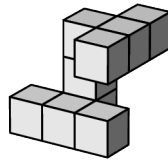


(**A**)          (**B**)          (**C**)          (**D**)          (**E**)

**29.** Werner chooses four of the numbers 2, 3, 4, 5 and 6 and writes one in each box so that the calculation is correct.

$$\boxed{\phantom{x}} + \boxed{\phantom{x}} - \boxed{\phantom{x}} = \boxed{\phantom{x}}$$
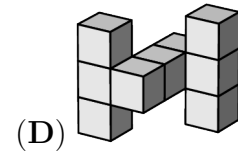
How many of the five numbers could Werner write in the shaded box?

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

**30.** Anna has the shape as shown.

Which of the following shapes is the same as Anna's?

(**A**)

(**B**)

(**C**)

(**D**)

(**E**)
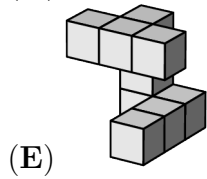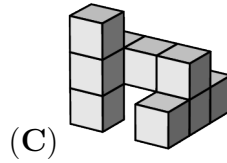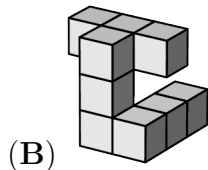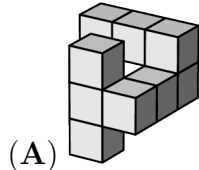
Name:

Institution:

| | | | | | |
|---|---|---|---|---|---|
| 01. | A | B | C | D | E |
| 02. | A | B | C | D | E |
| 03. | A | B | C | D | E |
| 04. | A | B | C | D | E |
| 05. | A | B | C | D | E |
| 06. | A | B | C | D | E |
| 07. | A | B | C | D | E |
| 08. | A | B | C | D | E |
| 09. | A | B | C | D | E |
| 10. | A | B | C | D | E |
| 11. | A | B | C | D | E |
| 12. | A | B | C | D | E |
| 13. | A | B | C | D | E |
| 14. | A | B | C | D | E |
| 15. | A | B | C | D | E |

| | | | | | |
|---|---|---|---|---|---|
| 16. | A | B | C | D | E |
| 17. | A | B | C | D | E |
| 18. | A | B | C | D | E |
| 19. | A | B | C | D | E |
| 20. | A | B | C | D | E |
| 21. | A | B | C | D | E |
| 22. | A | B | C | D | E |
| 23. | A | B | C | D | E |
| 24. | A | B | C | D | E |
| 25. | A | B | C | D | E |
| 26. | A | B | C | D | E |
| 27. | A | B | C | D | E |
| 28. | A | B | C | D | E |
| 29. | A | B | C | D | E |
| 30. | A | B | C | D | E |

Costa Rica