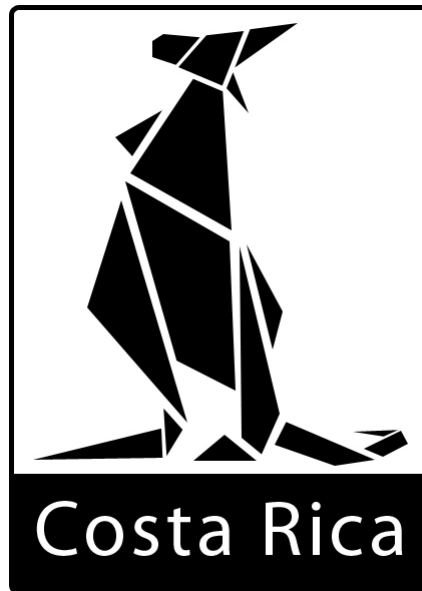


# Canguro Matemático Costarricense



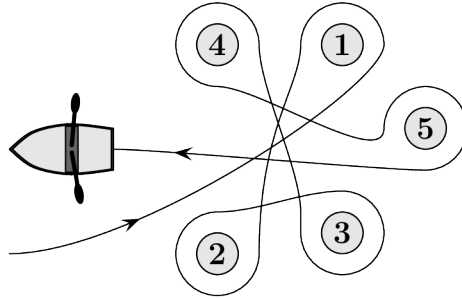
Cadet Test  
Seventh grade

Name of the student: \_\_\_\_\_

Name of the institution: \_\_\_\_\_

3 points

1. Meike paddled around five buoys, as shown.



Around which of the buoys did Meike paddle in a clockwise direction?

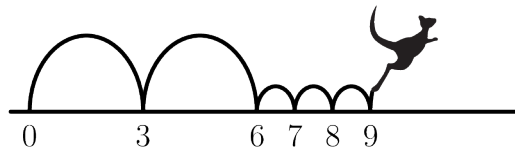
- (A) 2, 3 and 4                      (B) 1, 2 and 3                      (C) 1, 3 and 5  
 (D) 2, 4 and 5                      (E) 2, 3 and 5

2. Beate rearranges the five numbered pieces shown to display the smallest possible nine-digit number.

Which piece does she place at the right-hand end?

- (A) 4              (B) 8              (C) 31              (D) 59              (E) 107

3. Kengu enjoys jumping on the number line. He always makes two large jumps followed by three small jumps, as shown, and then repeats this process over and over again. Kengu starts his jumping routine on 0.



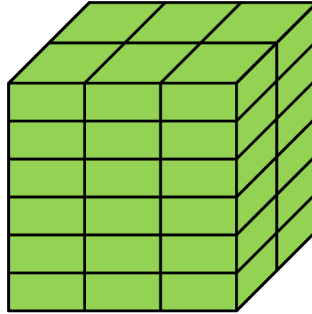
On which of these numbers will Kengu land during his routine?

- (A) 82                      (B) 83                      (C) 84                      (D) 85                      (E) 86

4. 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

5. 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)  $4 \times 6 \times 12$

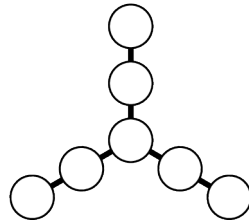
(B)  $4 \times 6 \times 16$

(C)  $4 \times 8 \times 12$

(D)  $4 \times 8 \times 16$

(E)  $4 \times 12 \times 16$

6. 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

7. In the statement below there are five empty spaces. Sanja wants to fill four of them with plus signs and one with a minus sign so that the statement is correct.

$$6 \square 9 \square 12 \square 15 \square 18 \square 21 = 45$$

Where should she place the minus sign?

(A) Between 6 and 9

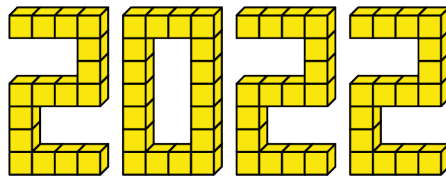
(B) Between 9 and 12

(C) Between 12 and 15

(D) Between 15 and 18

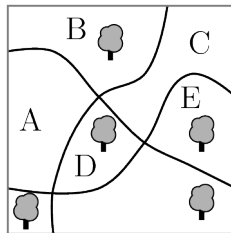
(E) Between 18 and 21

8. 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
9. There are five big trees and three paths in a park.



In which region of the park should a new tree be planted so that for each path, there are the same number of trees on both sides?

- (A) A    (B) B  
 (C) C    (D) D  
 (E) E
10. How many positive integers between 100 and 300 have only odd digits?
- (A) 25                      (B) 50                      (C) 75                      (D) 100                      (E) 150

4 points

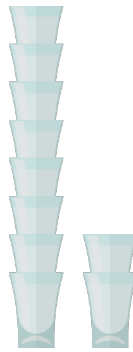
11. Gerard wrote down the sum of squares of two numbers, as shown.

$$(2\text{█})^2 + (\text{█}2)^2 = 7133029$$

Unfortunately some of the digits cannot be seen because they are covered in ink. What is the last digit of the first number?

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

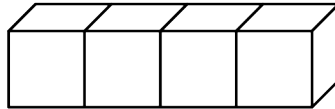
12. The distance between two shelves in the cupboard in Monica’s kitchen is 36 cm. She knows that a stack of 8 of her favourite glasses is 42 cm tall and that a stack of 2 glasses is 18 cm tall.



What is the largest number of glasses that can be stacked and still fit onto a shelf?

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

13. On a standard dice, the sum of the numbers of dots on opposite faces is always 7. Four standard dice are glued together, as shown.



What is the minimum number of dots that could lie on the whole surface?

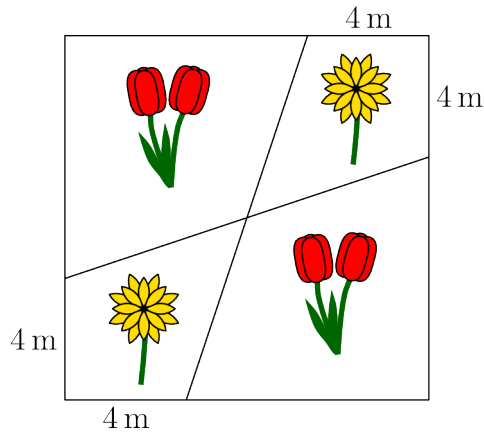
- (A) 52                      (B) 54                      (C) 56                      (D) 58                      (E) 60

14. Three sisters, whose average age is 10, each have different ages. When they get together in pairs, the average ages of two such pairs are 11 and 12. What is the age of the eldest sister?

- (A) 10                      (B) 11                      (C) 12                      (D) 14                      (E) 16



15. Tony the Gardener planted tulips and daisies in a square flowerbed with side-length 12 m, arranged as shown.



What is the total area of the regions in which he planted daisies?

- (A)  $48 \text{ m}^2$       (B)  $46 \text{ m}^2$       (C)  $44 \text{ m}^2$       (D)  $40 \text{ m}^2$       (E)  $36 \text{ m}^2$

16. In my office, there are two clocks. One clock gains one minute every hour and the other loses two minutes every hour. Yesterday I set them both to the correct time but when I looked at them today, I saw that the time shown on one was 11:00 and shown on the other was 12:00. What time was it when I set the two clocks?

- (A) 23:00      (B) 19:40      (C) 15:40      (D) 14:00      (E) 11:20

17. Werner wrote several positive numbers smaller than 7 on a piece of paper. Ria then crossed out all Werner's numbers and replaced each of them with their difference from 7. The sum of Werner's numbers was 22. The sum of Ria's numbers is 34. How many numbers did Werner write down?

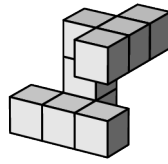
- (A) 7      (B) 8      (C) 9      (D) 10      (E) 11



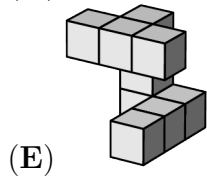
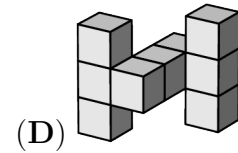
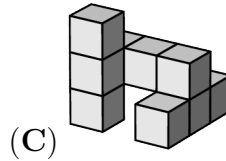
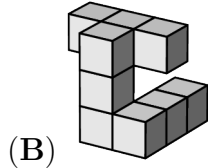
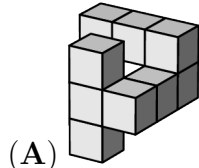




24. Anna has the shape as shown.



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



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

$$\square + \square - \square = \square$$

How many of the five numbers could Werner write in the shaded box?

(A) 1

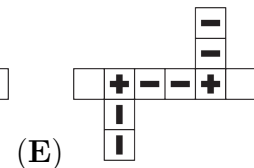
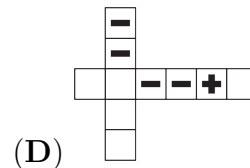
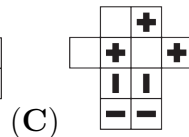
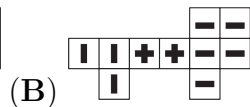
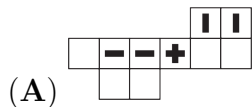
(B) 2

(C) 3

(D) 4

(E) 5

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



27. 30 people are sitting round a circular table. Some of them are wearing a hat. Those who do wear a hat always tell the truth while those who do not wear a hat can either lie or tell the truth. Each person says "At least one of my two neighbours is not wearing a hat." What is the largest number of people who could be wearing a hat?

(A) 5

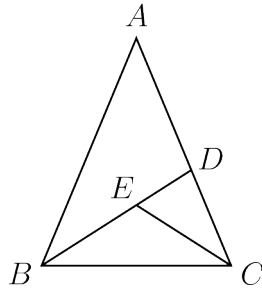
(B) 10

(C) 15

(D) 20

(E) 25

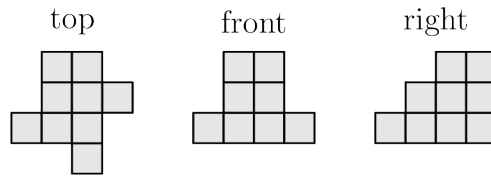
28. An isosceles triangle  $ABC$ , with  $AB = AC$ , is split into three smaller isosceles triangles, as shown, so that  $AD = DB$ ,  $CE = CD$ , and  $BE = EC$ . Note that the diagram is not drawn to scale.



What is the size, in degrees, of angle  $BAC$ ?

- (A) 24                      (B) 28                      (C) 30                      (D) 35                      (E) 36

29. The three pictures show a structure made from cubes as seen from the top, from the front and from the right.



What is the maximum number of cubes that could have been used to build the structure?

- (A) 18                      (B) 19                      (C) 20                      (D) 21                      (E) 22

30. Jenny decided to enter numbers into the cells of a  $3 \times 3$  table so that the sum of the numbers in all four possible  $2 \times 2$  squares will be the same. The numbers in three of the corner cells have already been written, as shown.

2		4
?		3

Which number should she write in the fourth corner cell?

- (A) 0                      (B) 1                      (C) 4                      (D) 5                      (E) 6

*KSF 2022 – Cadet Seventh grade*

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

