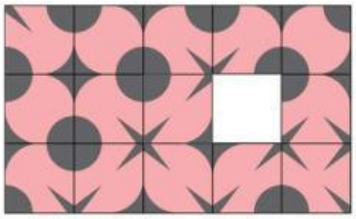
Canguru de Matemática Brasil – Level B – 2020 – Second Application

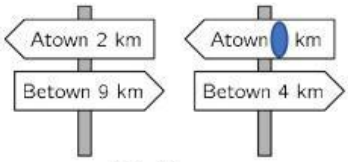
3 points

1. Which tile below completes the wall next to it?



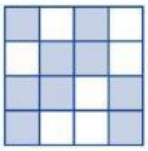
(A) (B) (C) (D) (E)

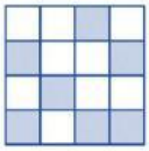
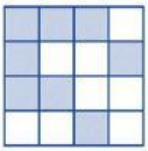
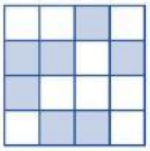
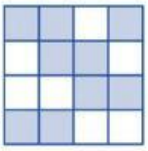
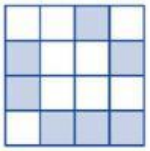
2. Amira is traveling from Atown to Betown and passes by two indicative signs along the road. One of them has a hidden number. What is this number?



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

3. The board beside is formed by little white and dark squares. After a ninety-degree turn, how can this board appear?

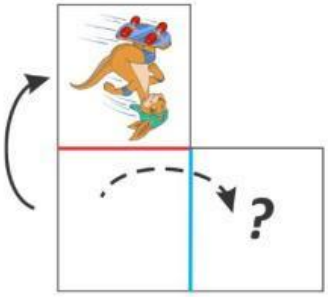


(A)  (B)  (C)  (D)  (E) 

4. Ana starts lighting a candle every 10 minutes. Each candle lasts 40 minutes. After 55 minutes, how many candles will be lit?

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

5. Turning a card around on the top side, we see the photo of the kangaroo. Instead, if we turn the card around on the right side, what will appear?



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

LIVEWORKSHEETS

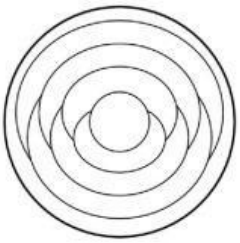
6. Bia has five coins as shown beside. She went to the grocery store to buy a fruit, using only three coins, without having to receive change. Among the prices of the following fruits, which one can she **NOT** buy?

(A) 1,30 (B) 1,35 (C) 1,40 (D) 1,55 (E) 1,75

7. In a garden, a bush has branches with seven leaves or branches with four leaves and a flower. Janaina counted the leaves and flowers and verified that there are 9 flowers and 120 leaves in the bush. How many branches does the bush have?

(A) 14 (B) 21 (C) 28 (D) 35 (E) 42

8. Cynthia paints each region of the figure in a single color: red, blue or yellow. She paints the regions that touch each other with different colors. In how many different ways can she color the figure?

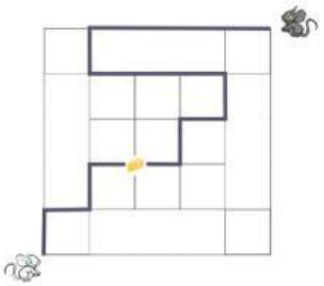


(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

9. Five boxes contain 2, 3, 4, 7 and 15 balls respectively. Peter wants to distribute the balls into the boxes so that any box has twice or half the number of balls in one of the remaining boxes. At least for how many balls should he change boxes?

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

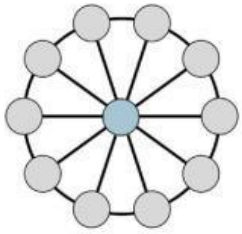
10. Two little mice, one white and one dark, leave, at the same time, towards the cheese, through different paths, as indicated in the picture, in which the little squares are equal. The two arrive at the same time to the cheese. If the dark mouse runs 4.5 meters per second, how many meters per second does the white mouse run?



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

4 points

11. The circles of the figure should be numbered from 0 to 10, each with a different number. The five sums of the three numbers written on each diameter must be odd numbers. If one of these sums is the smallest possible, what will be the largest possible value of one of the remaining sums?



(A) 13 (B) 15 (C) 17 (D) 19 (E) 21

LIVEWORKSHEETS

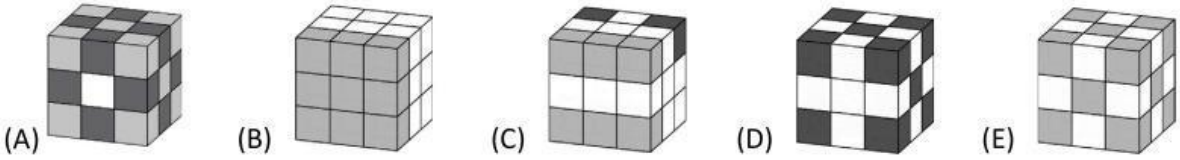
12. When the bat Elisa left its cave at night, the digital clock showed 10:20. When she came back in the morning and hung herself upside down, she looked at her watch and saw 10:20. How long did she stay out of the cave?

(A) 2h 48m (B) 2h 59m (C) 3h 39m (D) 3h 41m (E) 3h 49m

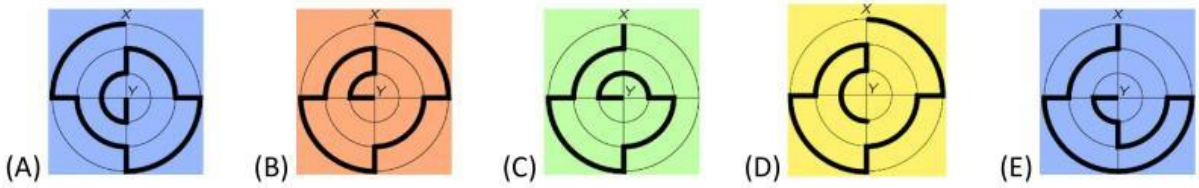
13. On a distant island, 2020 kangaroos, holding hands, form a large circle. These kangaroos are either brown and always tell the truth, or they are grey and only tell lies. Each one of them says the same thing: "One of my neighbors is brown and the other is gray". What is the number of brown kangaroos in this circle?

(A) 0 (B) 1009 (C) 1010 (D) 2019 (E) 2020

14. Maria has exactly 9 white cubes, 9 light gray cubes and 9 dark gray cubes, all the same size. She glues all these cubes together to form a larger cube. Which of the cubes below is the one she made?



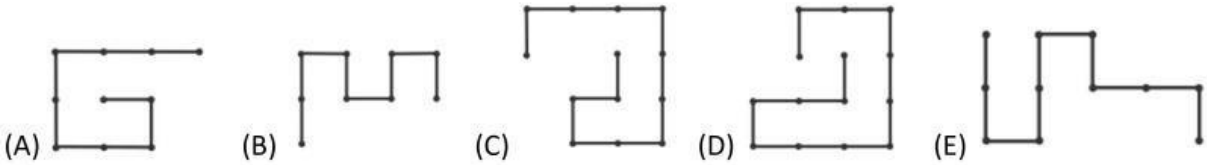
15. The following figures show five paths, indicated by the thickest lines, between the X and Y points. Which of these paths is the longest?



16. Mary numbered the sides of three cards from 1 to 6. Using these cards, she can compose three digit numbers, for example 135 or 234. But some numbers cannot be obtained, like 126. Which of the following numbers **CANNOT** be obtained?

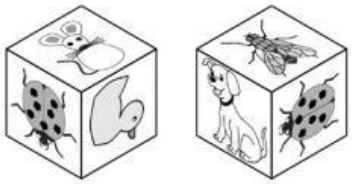
(A) 134 (B) 146 (C) 235 (D) 245 (E) 256

17. Which of the following indeformable pieces of wire, when duplicated, allows to make a closed piece without crosses, with the two pieces joined by their ends?



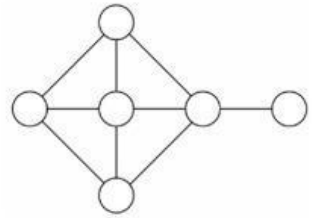
LIVEWORKSHEETS

18. Amelia glues these six stickers on the faces of a cube: . The figure shows this cube in two different positions. Which adhesive is on the opposite side of the duck?



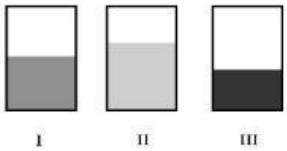
(A) (B) (C) (D) (E)

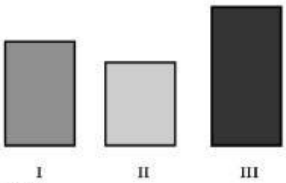
19. Beatriz has five sisters with ages of 2, 3, 5, 8, 10 and 17. Beatriz writes these ages in the circles of the opposite diagram, so that the sum of the ages in the four corners of the square is equal to the sum of the ages in the four circles aligned horizontally. What is this sum?



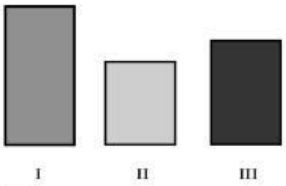
(A) 13 (B) 17 (C) 26 (D) 32 (E) There is more than one possible value.

20. Maria puts 4 liters of water in vase I, 3 liters of water in vase II and 4 liters of water in vase III, represented on the side. Seen from the front, these three vases seem to have the same size. Which of the following images can represent the three vases, when seen from above?

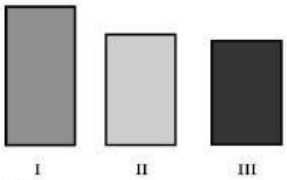




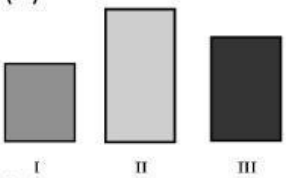
(A)



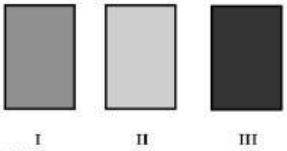
(B)



(C)



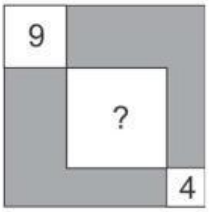
(D)



(E)

5 points

21. Inside the gray square there are three white squares and the numbers inside them indicate their areas. The white squares have sides parallel to the sides of the gray square. If the area of the gray square is 81, what is the area of the gray area not covered by the white squares?



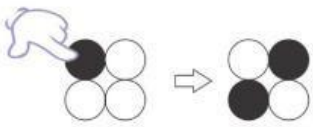
(A) 25 (B) 43 (C) 52 (D) 68 (E) 81

LIVEWORKSHEETS

22. John made a construction with wooden cubes of the same size, with the three views shown beside, using as many cubes as possible. Ana, John´s sister, wants to remove all the cubes she can, without modifying these three views. At most, how many cubes can she remove?

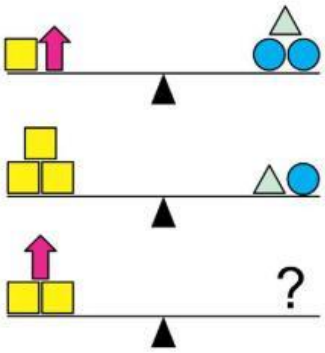
(A) None (B) 12 (C) 18 (D) 22 (E) 34

23. A panel is composed of 4 circles. When Lucy touches a circle, this circle and the others that touch this circle change their color from white to black or from black to white, as shown in the picture. Starting with all white circles, at least how many circles must Lucy touch, one after the other, so that all circles turn black?

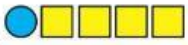


(A) 2 (B) 3 (C) 4 (D) 5 (E) more than 5

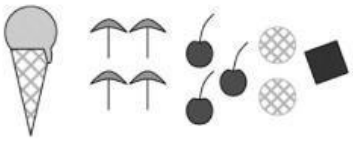
24. Which set of weights below balances the third scale, in the picture beside?



(A) (B) (C)

(D)  (E)

25. Ten people order an ice cream for each one. They ask for four vanilla ice creams, three chocolate ice creams, two lemon ice creams and one mango ice cream. As a topping, they ask for four umbrellas, three cherries, two wafers and a chocolate gum, one topping for each ice cream. Since they don't want two ice creams the same, which of the following combinations is possible?



(A) Chocolat and chocolate gum. (B) Mango and cherry. (C) Lemmon and wafer.
(D) Mango and wafer. (E) Lemmon and cherry.

26. We say that a three-digit number is *balanced* if the middle digit is the arithmetic mean of the other two digits. How many balanced numbers are divisible by 18?

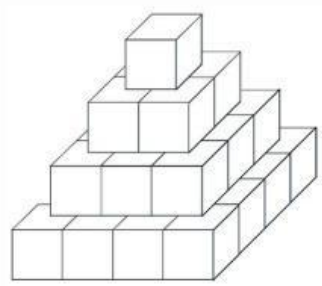
(A) 2 (B) 3 (C) 6 (D) 9 (E) 18

LIVEWORKSHEETS

27. Janaina bought three toys, spending all her money. For the first one she paid half of the money she had plus one Real, for the second one she paid half of what was left plus two Reais and for the third one she paid half of what was left plus three Reais. How much money did she have?

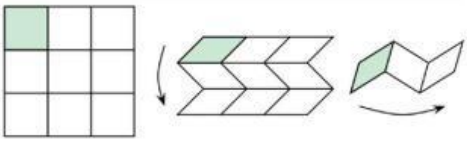
(A) 34 Reais (B) 36 Reais (C) 45 Reais (D) 65 Reais (E) 100 Reais

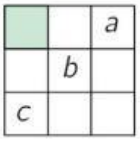
28. Dirce built the sculpture on the side by gluing cubic boxes of half a meter on the side. Then she painted the sculpture minus the support base, with a special paint sold in cans. Each can allow to paint 4 square meters of surface. How many cans of paint did she have to buy?



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

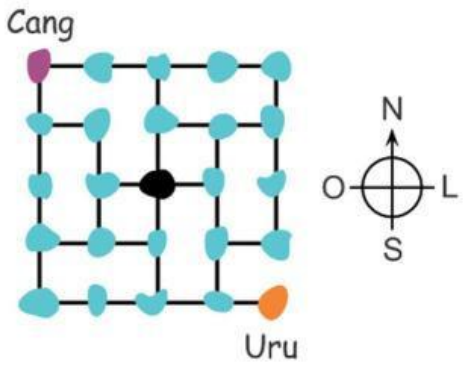
29. Vania has a sheet of paper divided into nine equal squares. She wants to fold the sheet as shown in the picture, initially with horizontal folds and then with vertical folds, until she leaves the colored square on top of the layers. Vania wants to write the numbers from 1 to 9, one in each square, so that these numbers are in ascending order, starting with the number 1 at the top, after the folds are made above. On the open sheet, indicated at the side, which numbers should she write in place of *a*, *b* and *c*?





(A) $a = 9, b = 5, c = 3$ (B) $a = 4, b = 6, c = 8$ (C) $a = 7, b = 5, c = 3$
(D) $a = 3, b = 5, c = 7$ (E) $a = 6, b = 4, c = 7$

30. The figure shows a map with some islands and how they are connected by bridges. A navigator wants to pass through each of the islands exactly once. He started at Cang Island and wants to finish at Uru Island. He has just arrived at the black island in the center of the map. In which direction must he go now to be able to complete his route?



(A) North. (B) East. (C) South.

(D) West. (E) There is more than one possible choice.

LIVEWORKSHEETS