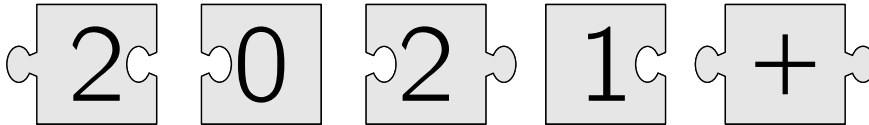# CANADIAN MATH KANGAROO CONTEST PROBLEMS

PART A: EACH CORRECT ANSWER IS WORTH 3 POINTS

1. When you put the puzzle pieces together correctly, they form a rectangle with a calculation on it.

$$2 \quad 0 \quad 2 \quad 1 \quad +$$

What is the result of this calculation?

     (A) 22   **(B)** 32   **(C)** 41   **(D)** 122   **(E)** 203

2. Carin is going to paint the walls in her room green. The green paint is too dark so she mixes it with white paint. She tries different mixtures. Which of the following mixtures will give the darkest green colour?

     (A) 1 part green + 3 parts white   **(B)** 2 parts green + 6 parts white

     (C) 3 parts green + 9 parts white   **(D)** 4 parts green + 12 parts white

     (E) They will all be equally dark

3. These children are holding hands. Some are facing forward and others are facing backward.

In how many places in the picture are two children holding each other with their left hand?

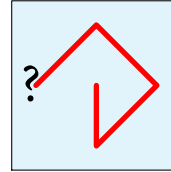   **(A)** 1   **(B)** 2   **(C)** 3   **(D)** 4   **(E)** 5

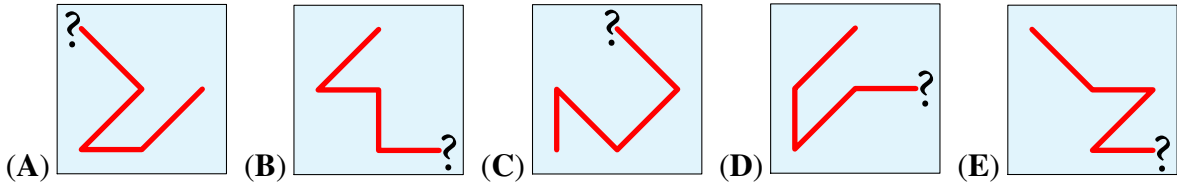|		
1	2	3
4	5	6
7	8	9

4. In the square you can see the digits from 1 to 9.
A number is created by starting at the question mark ?, following the line and writing down the digits along the line while passing.
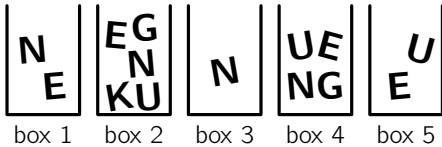
For example, the line shown represents the number 42685.
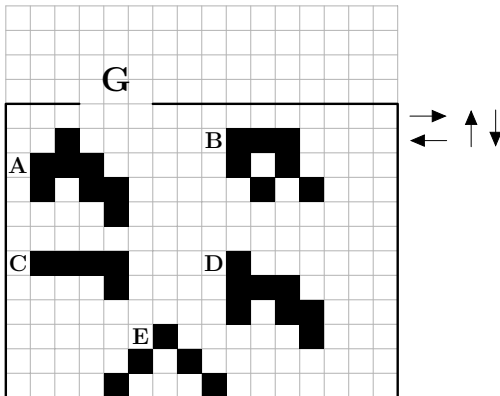Which of the following lines represents the largest number?

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

5. Sofie wants to write the word KENGU by using letters from the boxes.
She can only take one letter from each box.

box 1	box 2	box 3	box 4	box 5
N E	E G N KU	N	U E NG	U E

Which letter must Sofie take from box 4?

(A) K   (B) E   (C) N   (D) G   (E) U

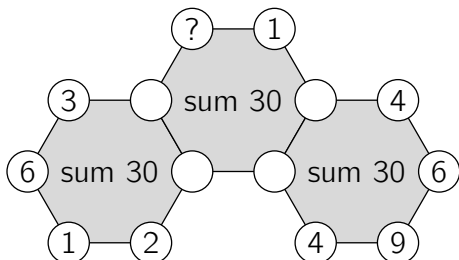**6.** The five figures on the grid can only move in the directions indicated by the black arrows.

Which figure can leave through gate G?

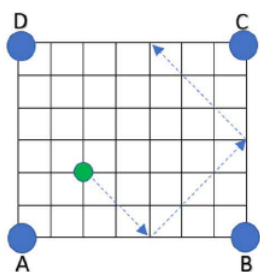(A) A   (B) B   (C) C   (D) D   (E) E

7. The diagram shows three hexagons with numbers at their vertices, but some numbers are invisible. The sum of the six numbers around each hexagon is 30.
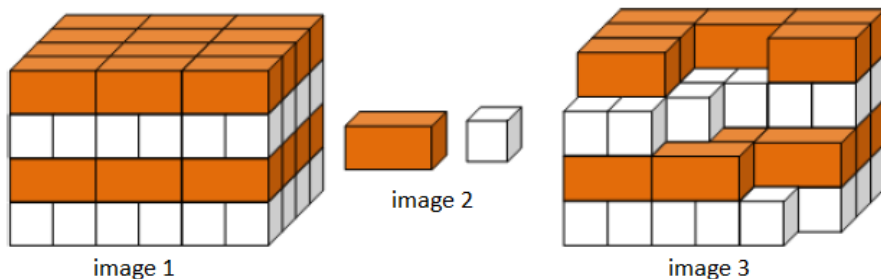

What is the number on the vertex marked with a question mark?

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

8. A green ball rolls on a table with edges and in the direction as the arrows show.

Which hole will the ball fall into if it continues to roll in the same way?

(A) A   (B) B   (C) C

(D) D   (E) None of these four holes

9. In image 1, the cuboid is built only from the pieces in image 2.
    Two storeys are white, two are orange.

How many orange and white pieces fell off of the block if the formation in image 3 was formed?

(A) 7 orange, 8 white   (B) 8 orange, 7 white   (C) 7 orange, 6 white
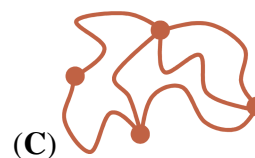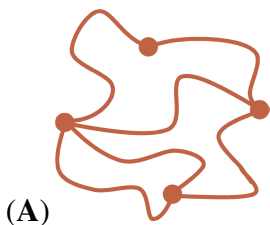
(D) 6 orange, 8 white   (E) 6 orange, 6 white

10. Mr Gordian had six pieces of string which he tied together using 4 knots, as shown.

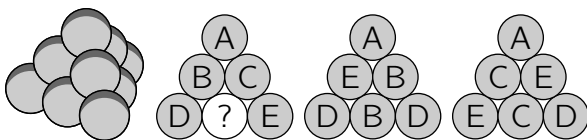Later Mr Gordian dropped his construction to the floor.
Which of the following is Mr Gordian's construction?

(A)   **(B)**   **(C)**

(D)   **(E)**

PART B: EACH CORRECT ANSWER IS WORTH 4 POINTS

11. A triangular pyramid is built with ten identical balls, as shown. Each ball has one of the letters A, B, C, D and E on it. There are two balls marked with each letter. The picture shows three side views of the pyramid.

What is the letter on the ball with the question mark?

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

12. There were 20 apples and 20 pears in a box. Carl randomly took 20 pieces of fruit from the box and Luca took the rest.

Which of the following statements is always true?

(**A**) Carl got at least one pear.   (**B**) Carl got as many apples as pears.

(**C**) Carl got as many apples as Luca.   (**D**) Carl got as many pears as Luca got apples.

(**E**) Carl got as many pears as Luca.

13. The number 5021972970 is written on a sheet of paper.

Julian cuts the sheet twice so he gets three numbers.

What is the smallest sum he can get by adding these three numbers?

   **(A)** 3244   **(B)** 3444   **(C)** 5172   **(D)** 5217   **(E)** 5444

14. The map shows three bus stations at points A, B and C. A tour from station A to the Zoo and the Port and back to A is 10 km long. A tour from station B to the Park and the Zoo and back to B is 12 km long. A tour from station C to the Port and the Park and back to C is 13 km long. A tour from the Zoo to the Park and the Port and back to the Zoo is 15 km long.
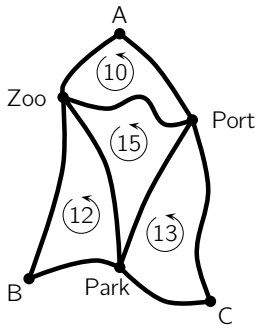
How long is the shortest tour from A to B to C and back to A?

     (A) 18 km   **(B)** 20 km   **(C)** 25 km   **(D)** 35 km   **(E)** 50 km

15. Three rectangles of the same height are positioned as shown. The numbers within the rectangles indicate their areas in cm^2.
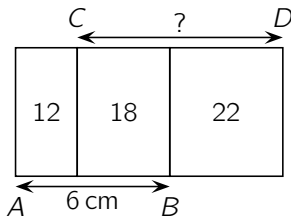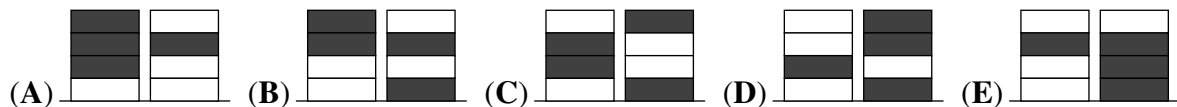

If $AB = 6$ cm, how long is CD?

     (A) 7 cm   **(B)** 7.5 cm   **(C)** 8 cm   **(D)** 8.2 cm   **(E)** 8.5 cm

16. Ronja had four white tokens and Wanja had four dark tokens. They played a game, taking turns to place one token at a time on top of one of the two piles of previously placed tokens.
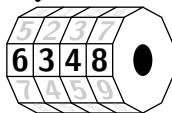
Ronja started first. Which of the configurations would not be possible to create?

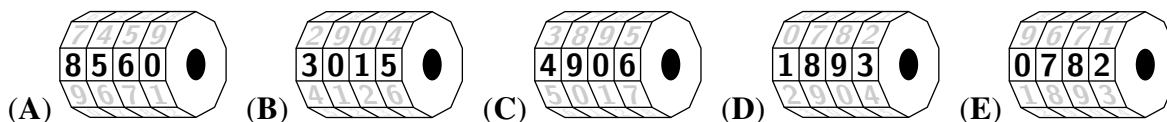   **(A)**   **(B)**   **(C)**   **(D)**   **(E)**

17. My little brother has a 4-digit bike lock with the digits 0 to 9 on each part of the lock as shown.
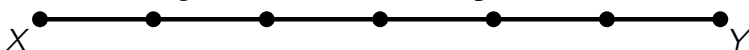

He started on the correct combination and turned each part the same amount in the same direction and now the lock shows the combination 6348.

Which of the following CANNOT be the correct combination of my brother's lock?

(A) 8560 (B) 3015 (C) 4906 (D) 1893 (E) 0782

**18.** There is a single train track between points X and Y.

A train company wants one train to leave from X and one train to leave from Y at the same time daily. Moving with constant speed it takes 180 minutes for a train to make a trip from X to Y and 60 minutes from Y to X. They want to build a double track to avoid a crash.
Where should the double track be?

(A) X ——— Y

(B) X ——— Y

(C) X ——— Y

(D) X ——— Y

(E) X ——— Y
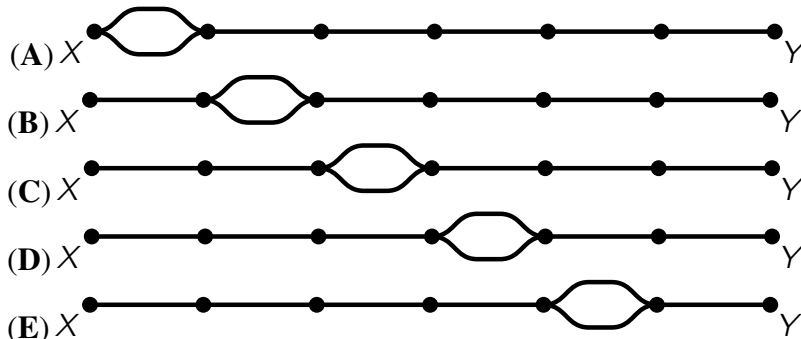
19. What is the smallest number of shaded squares that can be added to the diagram to create a design of 6×6 with four lines of symmetry?

(A) 1   (B) 9   (C) 12   (D) 13   (E) 21

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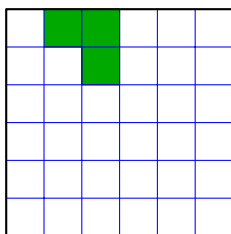
20. Three pirates were asked how many coins and how many diamonds their friend Graybeard had. Each of the three pirates answered one of the question truthfully and the other question falsely. Their answers are written on the piece of paper pictured.

> (1) He has 8 coins and 6 diamonds.
> (2) He has 7 coins and 4 diamonds.
> (3) He has 7 coins and 7 diamonds.

What is the total number of coins and diamonds that Graybeard has?

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

PART C: EACH CORRECT ANSWER IS WORTH 5 POINTS

21. A large cube has side length 7 cm. On each of its 6 faces, the two diagonals are drawn in red. The large cube is then cut into small cubes with side length 1 cm.
How many small cubes will have at least one red line drawn on it?

(A) 54   (B) 62   (C) 70   (D) 78   (E) 86

22. Maurice asked the canteen chef for the recipe for his pancakes.
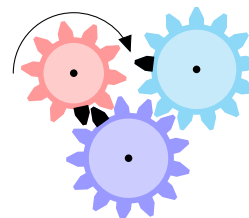
> Ingredients for 100 pancakes
> 25 eggs   4 l milk
> 5 kg flour   1 kg butter

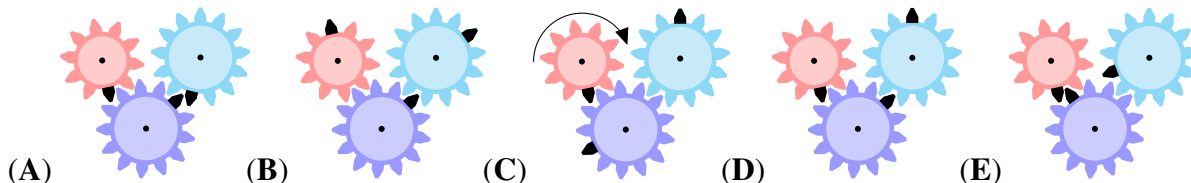Maurice has 6 eggs, 400 g of flour, 0.5 litres of milk and 200 g of butter.
What is the largest number of pancakes he can make using this recipe?
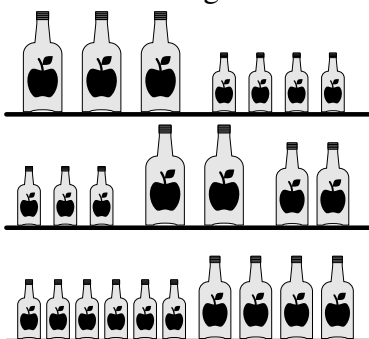
(A) 6   (B) 8   (C) 10   (D) 12   (E) 15

23. The picture shows three gears with a black gear tooth on each.   Which picture shows the correct position of the black teeth after the small gear has turned a full turn clockwise?

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

24. Each shelf holds a total of 64 decilitres of apple juice. The bottles have three different sizes: small, medium and large.

How many decilitres of apple juice does a medium bottle contain?

(A) 3   (B) 6   (C) 8   (D) 10   (E) 14

25. Ann, Bob, Carina, Dan and Ed are sitting at a round table.
Ann is not next to Bob, Dan is next to Ed and Bob is not next to Dan.
Which two people are sitting next to Carina?

(A) Ann and Bob   (B) Bob and Dan   (C) Dan and Ed   (D) Ed and Ann

(E) It is not possible to be certain

26. An apple and an orange weigh as much as a pear and a peach. An apple and a pear weigh less than an orange and a peach, and a pear and an orange weigh less than an apple and a peach.
Which fruit is the heaviest?

(A) apple   (B) orange   (C) peach   (D) pear

(E) impossible to determine

27. 201 balls are arranged in a row and are numbered from 1 to 201. Each ball is colored either green or red. Among any ten consecutive balls there are exactly five green balls. Ball number 1 is green. How many red balls are there in the row?

     (A) 99   (B) 100   (C) 101   (D) 199   (E) 200

28. Barnabe transforms the numbers from 1 to 100 by the rule: each number is replaced by the number obtained by adding the original number with the sum of its digits.
Among the newly obtained numbers, how many are even?

     (A) 49   (B) 50   (C) 51   (D) 45   (E) 55

29. In a group of 10 elves and trolls, each were given a token with a different number from 1 to 10 written upon it. They were each asked what number was on their token and all answered with a number from 1 to 10. The sum of the answers was 36. Each troll told a lie and each elf told the truth. What is the smallest number of trolls there could be in the group?

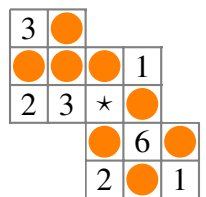   (A) 1   (B) 3   (C) 4   (D) 5   (E) 7

30. Dale has a shape made up of four squares .
He places the shape on a grid figure so that it completely covers four of the grid cells.
Every time Dale does this, the number in the four covered cells increases by 1, as shown below.
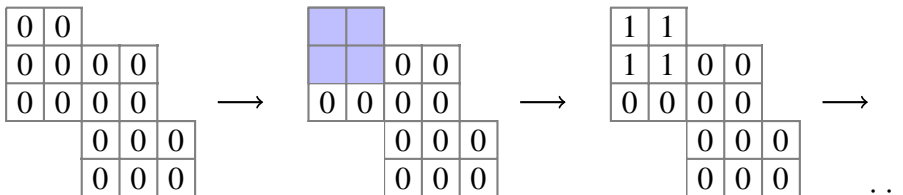
Starting with 0 in every cell of the grid, Dale places his shape several times as described.

In the end, Dale hid some numbers with circle stickers:
What number should be in the square marked by ⋆ ?

     (A) 5   (B) 4   (C) 10   (D) 6   (E) 13

For training purposes only!

International Contest-Game
Math Kangaroo Canada, 2021

Answer Key
Grade 5-6

1	A **B** C D E	**11**	**A** B C D E	**21**	A **B** C D E
2	A B C D **E**	**12**	A B C **D** E	**22**	A **B** C D E
3	**A** B C D E	**13**	A **B** C D E	**23**	**A** B C D E
4	A B C D **E**	**14**	A **B** C D E	**24**	A B C **D** E
5	A B C **D** E	**15**	A B **C** D E	**25**	**A** B C D E
6	A **B** C D E	**16**	A B C D **E**	**26**	A B **C** D E
7	A **B** C D E	**17**	A B **C** D E	**27**	A **B** C D E
8	**A** B C D E	**18**	A **B** C D E	**28**	**A** B C D E
9	**A** B C D E	**19**	A B C D **E**	**29**	A **B** C D E
10	A B C **D** E	**20**	A B **C** D E	**30**	**A** B C D E