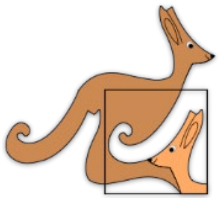


INTERNATIONAL CONTEST-GAME
MATH KANGAROO
CANADA

INSTRUCTIONS
GRADE 5-6

1. You have 75 minutes to solve 30 multiple choice problems. For each problem, decide which answer is correct and fill in (blacken) the oval that has the same letter as the appropriate answer. If you fill in (blacken) more than one oval for a question, your response will be marked as wrong.

1. Record your answers in the response form. Remember that this is the only sheet that is marked, so make sure you have all your answers transferred to that form before giving it back to the contest supervisor.
2. The problems are arranged in three groups. A correct answer of the first 10 problems is worth 3 points. A correct answer of problems 11-20 is worth 4 points. A correct answer of problems 21-30 is worth 5 points. For each incorrect answer, one point is deducted from your score. Each unanswered question is worth 0 points. To avoid negative scores, you start from 30 points. The maximum score possible is 150.
3. The use of external material or aid of any kind is **not permitted**.
4. The figures *are not* drawn to scale. They should be used only for illustration purposes.
5. Remember, you have about 2 to 3 minutes for each problem; hence, if a problem appears to be too difficult, save it for later and move on to another problem.
6. At the end of the allotted time, please **give the response form to the contest supervisor**.
7. Your score and electronic Certificate of Participation will be available in your account after June 1.

Good luck and enjoy!

Canadian Math Kangaroo Contest team

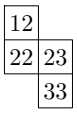
CANADIAN MATH KANGAROO CONTEST PROBLEMS

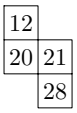
PART A: EACH CORRECT ANSWER IS WORTH 3 POINTS

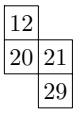
1. Holger fills the rest of the table with the numbers up to 40, by following the pattern shown.

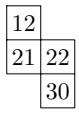
1	2	3	4	5	6	7	8
9	10	11	12				

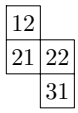
Which of the pieces shown could he cut from the table?

(A) 

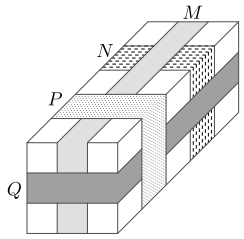
(B) 

(C) 

(D) 

(E) 

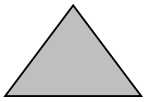
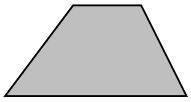
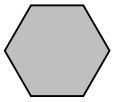
2. The figure shows a parcel surrounded by four bands (stripes) labeled M, N, P and Q.



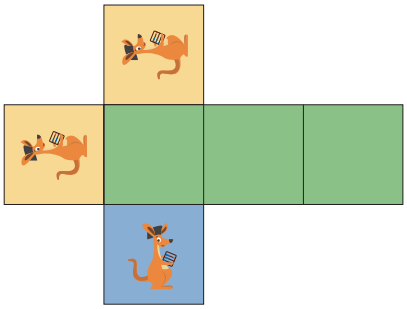
In what order, from first to last, were the tapes placed?

(A) M, N, Q, P **(B)** N, M, P, Q **(C)** N, Q, M, P **(D)** N, M, Q, P **(E)** Q, N, M, P

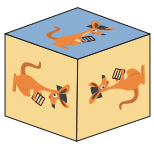
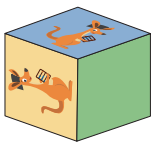
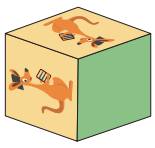
3. Which of the shapes below cannot be divided into two trapezoids by a single straight line?

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

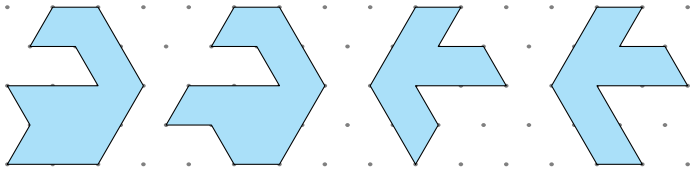
4. Rosalinde folds the net shown below to form a cube.

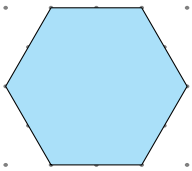


Which of the following five cubes can she get from this net?

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

5. Alice has the four puzzle pieces shown.



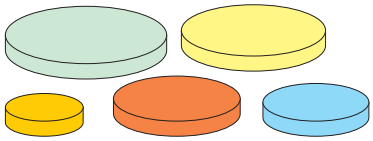


Which pair can she combine to form this hexagon?

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

6. Anna has five discs of different sizes.
She wants to build a tower of four discs so that each disc in her tower is smaller than the disc immediately below it.

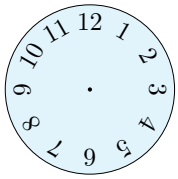
How many different towers could Anna build?

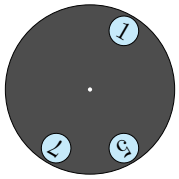


(**A**) 4 (**B**) 5 (**C**) 9 (**D**) 12 (**E**) 20

7. The black disc with three holes is placed above the clock face and then rotated around its center.

Which three numbers is it possible to see at the same time?

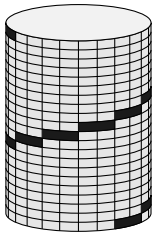




(**A**) 2, 4 and 9 (**B**) 1, 5 and 10 (**C**) 4, 6 and 12 (**D**) 3, 6 and 9 (**E**) 5, 7 and 12

8. Claude climbs from the bottom to the top of the cylindrical tower shown.
The steps are all equal sized.
Nine steps are visible.

How many steps are not visible?



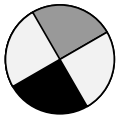
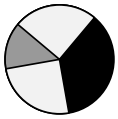
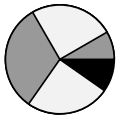
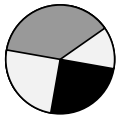
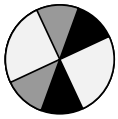
(**A**) 9 (**B**) 10 (**C**) 11 (**D**) 12 (**E**) 13

9. Francesca wrote down three consecutive 2-digit numbers in their natural order, but instead of the digits she used symbols. These symbols are: □◊, ♡△, ♡□. Which number is next?

(**A**) □♡ (**B**) □□ (**C**) ♡♡ (**D**) ◊□ (**E**) ♡◊

10. Jonte glued these three pieces of paper  on top of  .

What figure can he NOT obtain?

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

PART B: EACH CORRECT ANSWER IS WORTH 4 POINTS

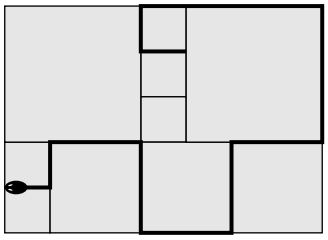
11. Maria, Peter, Richard and Tina were playing football in the classroom and broke a window. When the principal asked who did it, she got the following responses: Maria: "It was Peter." Peter: "It was Richard." Richard: "It wasn't me." Tina: "It wasn't me." Only one child was telling the truth.

Who broke the window?

(**A**) Maria (**B**) Tina (**C**) Peter (**D**) Richard

(**E**) can't be determined with certainty

12. The Potters have a patio which is tiled with square tiles of three different sizes.
The smallest squares have a perimeter of 80 cm each.
A snake rests on the patio, as shown in the diagram.



What is the length of the snake?

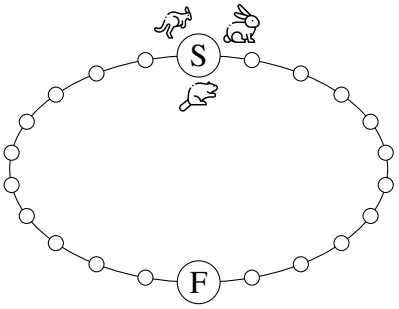
(**A**) 380 cm (**B**) 400 cm (**C**) 420 cm (**D**) 440 cm (**E**) 1680 cm

13. When I look in a mirror, I can see the image of my digital clock standing on the table behind me, as shown.

What image will I see when I look in the mirror 30 minutes later?

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

14. A rabbit, a beaver and a kangaroo are having a competition. The beaver moves one step at a time, the rabbit moves two steps at a time and the kangaroo moves three steps at a time. They all start from the point marked S. The winner is the animal who lands exactly on the point marked F in the smallest number of complete moves. Who wins the competition?



(**A**) the beaver (**B**) the rabbit (**C**) the kangaroo

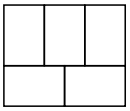
(**D**) the kangaroo and the rabbit (**E**) the kangaroo and the beaver

15. Lonneke wants the sum of the numbers in the white cells to equal the sum of the numbers in the grey cells. Which two numbers does she need to swap?

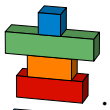
1	3	5	2	13
7	4	6	8	11

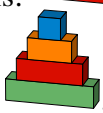
(**A**) 2 and 8 (**B**) 3 and 7 (**C**) 1 and 11 (**D**) 4 and 13 (**E**) 7 and 13

16. The figure shows five rectangles. Lukas wants to colour the rectangles red, blue and yellow so that any two adjacent rectangles are coloured in different colours. In how many different ways can he do this?

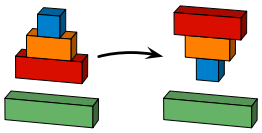


(**A**) 3 (**B**) 4 (**C**) 5 (**D**) 6 (**E**) 7

17. Goran has four blocks stacked like this:  .

He wants the blocks to be stacked as:  .

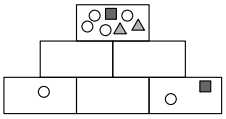
In a single move, Goran can take some, or all, of the blocks from the top of the stack and place them upside down on the stack.



What is the smallest number of moves he needs to make to get the correct order?

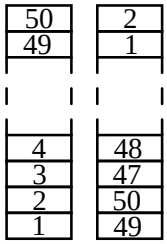
(**A**) 2 (**B**) 3 (**C**) 4 (**D**) 5 (**E**) 6

18. Tian wants to draw figures on the six boxes of the pyramid shown. Each box should contain all of the figures on the two boxes directly below it and nothing more. She has drawn the figures on some of the boxes already. Which figures should she draw on the box in the middle of the bottom row?



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

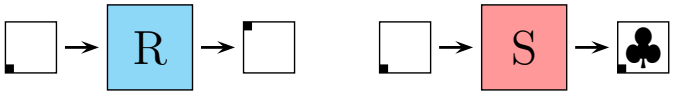
19. On a table, there is a tower made of blocks numbered from 1 to 50.
Emma builds a new tower in the following way.
She takes two blocks from the top of the original tower and puts them on the table as the base of the new tower.
She continues by taking the two top blocks from the remainder of the original tower and putting them on the top of the new tower, as seen in the figure.



Which of the following pairs of numbers are on adjacent blocks in the new tower?

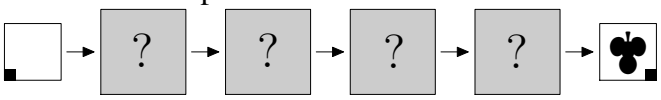
(**A**) 29 and 28 (**B**) 34 and 35 (**C**) 29 and 26 (**D**) 31 and 33 (**E**) 27 and 30

20. Joanna has two machines.



– When she puts a square sheet of paper in machine R, it turns the paper 90° clockwise.
– When she puts the paper in machine S, it stamps the paper with a ♣.

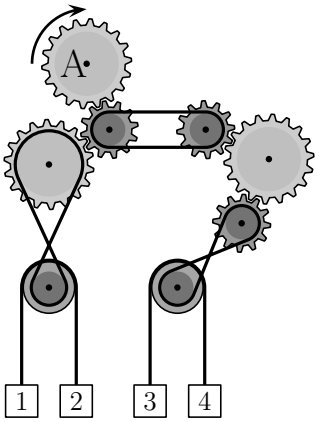
In which order are the machines used to produce the result shown?



(**A**) SRRR (**B**) RSRR (**C**) SRSR (**D**) RRRS (**E**) SRRS

PART C: EACH CORRECT ANSWER IS WORTH 5 POINTS

21. The gear marked A is turned clockwise, as shown.
Which two boxes will move upwards?



(**A**) 1 and 4

(**B**) 2 and 3

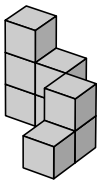
(**C**) 1 and 3

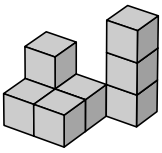
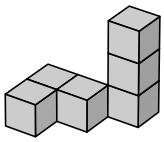
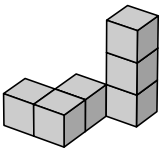
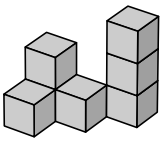
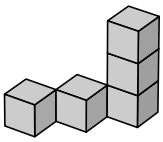
(**D**) 2 and 4

(**E**) It cannot be determined

22. Martha chose one of the five structures below and combined it with the structure on the right.
The table shows the number of cubes in each column in the combined structure when seen from above.
Which of the five structures did Martha choose?

3	2	3
2	1	2
1	0	1



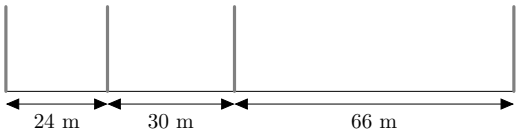
(**A**) 
(**B**) 
(**C**) 
(**D**) 
(**E**) 

23. Sonia and Robert are playing a game. They can alternately take 1, 2, 3, 4 or 5 tiles from a pile of tiles. Whoever takes the last tile or tiles loses. At one point of the game, there are 10 tiles left in the pile and it is Sonia's turn to take some tiles.

How many tiles should Sonia leave to Robert to be sure that she will win?

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

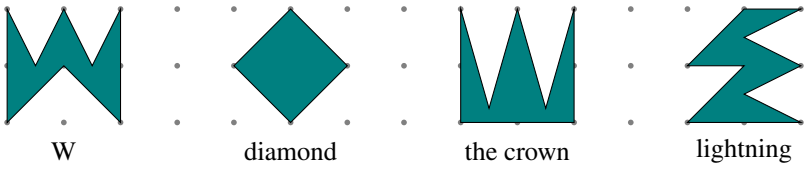
24. Four stakes are placed along a 120 m track, as shown.



What is the smallest number of stakes that should be added so that the track is divided into sections of equal length?

(**A**) 12 (**B**) 15 (**C**) 17 (**D**) 20 (**E**) 37

25. Which of the following four shapes has the greatest area?



(**A**) W (**B**) diamond (**C**) the crown (**D**) lightning (**E**) areas are equal

26. Peter has two coins with a number on each side. One of the coins has the number 7 on one side, and the other has the number 10 on one side. By tossing the coins and adding the numbers on top of the two coins, he can get four different results: 11, 12, 16 and 17.

How many different numbers can be on the opposite side of the coin with 7 on the other side?

(**A**) 1 (**B**) 2 (**C**) 3 (**D**) 4 (**E**) 7

27. In a second-hand shop, two hats are sold for the same price as five skirts, three skirts for the same price as eight t-shirts and two t-shirts for the same price as three caps.

Which of the following collections is the most valuable?

(**A**) a hat and five skirts

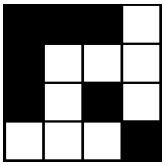
(**B**) a hat, three skirts and a cap

(**C**) eight skirts and six t-shirts

(**D**) thirty-seven caps

(**E**) three skirts and three caps

28. In Kangarooland the alphabet used by the inhabitants has only three letters: K, G and R. On the side we see a crossword in Kangarooland language. When completed it uses 4 of the 5 words: KKG; KGK; GRK; RGK; RGG.



Which word is not used?

(**A**) KKG (**B**) KGK (**C**) GRK (**D**) RGK (**E**) RGG

29. The teacher wrote on the board the numbers 1 to 15. She then split them in five groups of three. The sum of the numbers in each of the first four groups was 25, 27, 30 and 31.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15

In which group did she put number 4?

(**A**) the first (**B**) the second (**C**) the third (**D**) the fourth (**E**) the fifth

30. In the multiplication shown A, B, C, D and E represent different digits.

$$\begin{array}{r} 1\ A\ B\ C\ D\ E \\ \times \qquad\qquad 3 \\ \hline A\ B\ C\ D\ E\ 1 \end{array}$$

If the multiplication is correct, what is the letter that has a value equal to 8?

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

CMKC 2023 Grade 5-6 Answers

PART A					
1	A	B	**C**	D	E
2	A	B	C	**D**	E
3	**A**	B	C	D	E
4	A	**B**	C	D	E
5	A	**B**	C	D	E
6	A	**B**	C	D	E
7	A	B	**C**		E
8	A	B	C	**D**	E
9	A	B	**C**	D	E
10	A	B	**C**	D	E

PART B					
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

PART C					
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