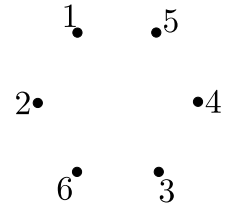


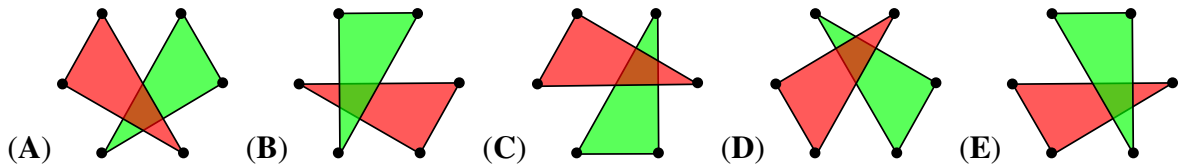
CANADIAN MATH KANGAROO CONTEST PROBLEMS

PART A: EACH CORRECT ANSWER IS WORTH 3 POINTS

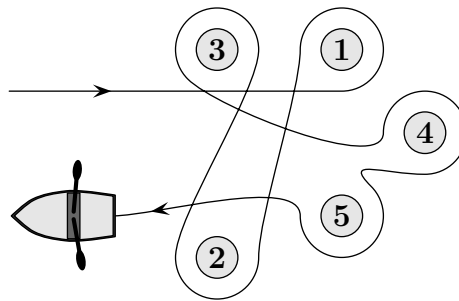
1. Six points are numbered as shown. Kirsten draws two triangles and colors them. One of the triangles joins the even numbered points and the other triangle joins the odd numbered points.



Which of the five options shows the drawing of Kirsten?

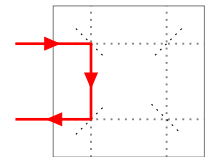


2. Eileen rowed around five buoys, as shown.

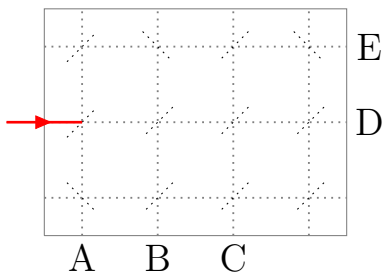


Which buoys did Eileen row around in a counterclockwise direction?

- (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 on the right.



At which letter will this laser beam end up?



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



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

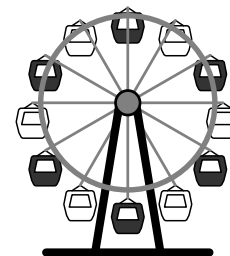
(A) $\frac{1}{2}$

(B) $\frac{1}{3}$

(C) $\frac{1}{6}$

(D) $\frac{1}{12}$

(E) $\frac{5}{6}$



5. Marbles are sold in packages of 5, 10 and 25. Tom buys exactly 95 marbles.

What is the minimum number of packages he could buy?

(A) 4

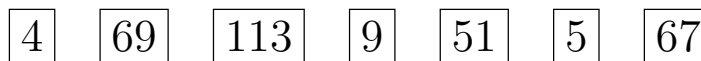
(B) 5

(C) 7

(D) 8

(E) 10

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



What are the 3 rightmost digits of this number?

(A) 699

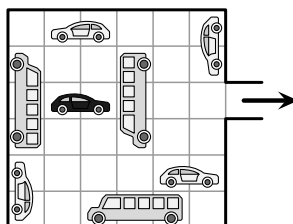
(B) 113

(C) 551

(D) 967

(E) 459

7. In the garage shown, vehicles can only move forward or backward. They cannot turn.



What is the fewest number of vehicles that have to move so that the black car can exit the garage?

(A) 2

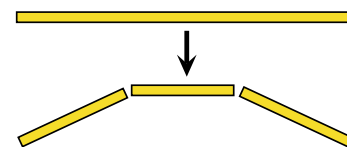
(B) 3

(C) 4

(D) 5

(E) 6

8. Giulia has one long strand 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

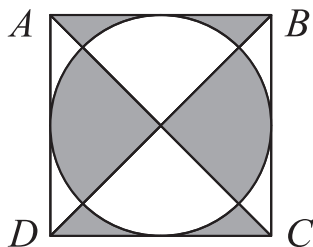
(B) 17

(C) 20

(D) 23

(E) 25

9. In the diagram, the square $ABCD$ has side-lengths of 10 cm.



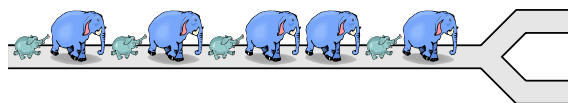
What is the area of the shaded part of the square?

- (A) 40 cm^2 (B) 45 cm^2 (C) 50 cm^2 (D) 55 cm^2 (E) 60 cm^2
10. Sixty tiles are laid in a long line.
 – First, Adam removes every sixth tile.
 – Next, Berta removes every fifth tile from the remaining tiles.
 – Then, Caleb comes and removes every fourth tile from the remaining tiles.
 – Finally, Doris removes all the remaining tiles.
 How many tiles does Doris remove?

- (A) 0 (B) 10 (C) 30 (D) 40 (E) 50

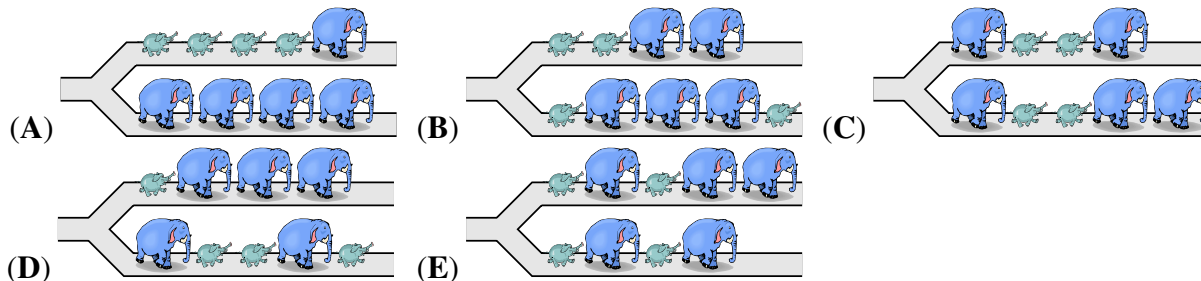
PART B: EACH CORRECT ANSWER IS WORTH 4 POINTS

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

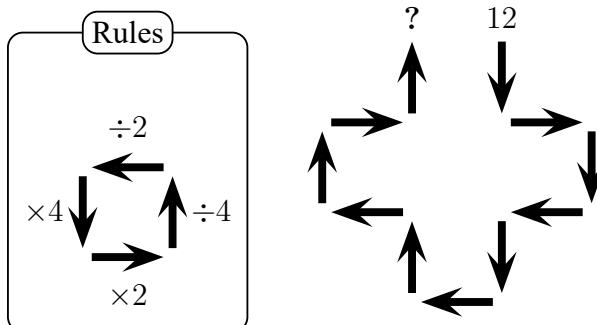


When they reach the junction, each elephant turns either to the left or to the right.

Which of the following *cannot* be the situation after they all pass the junction?

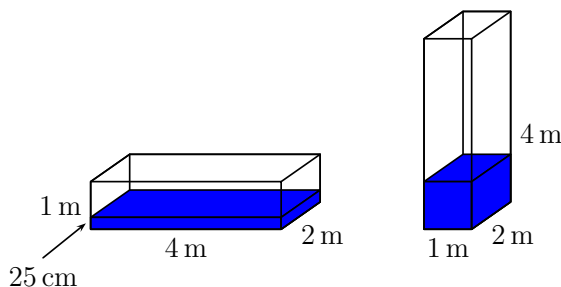


12. Clara starts with the number 12 and follows the arrows shown in the right diagram while performing the operations using the rules shown in the left diagram.



What number will she finish with?

- (A) 3 (B) 6 (C) 12 (D) 24 (E) 48
13. 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 age that Eva could be by the end of 2022?
- (A) 18 (B) 20 (C) 22 (D) 23 (E) 134
14. A rectangular-based water tank has dimensions $1\text{ m} \times 2\text{ m} \times 4\text{ m}$. It contains water to a depth of 25 cm, as shown in the left-hand picture. The tank is turned so that a $1\text{ m} \times 2\text{ m}$ face becomes the base, as shown in the right-hand picture.

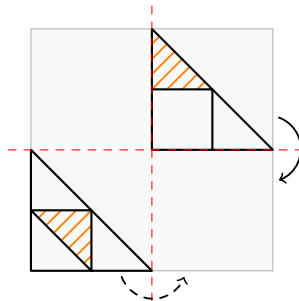


What is the depth of the water now?

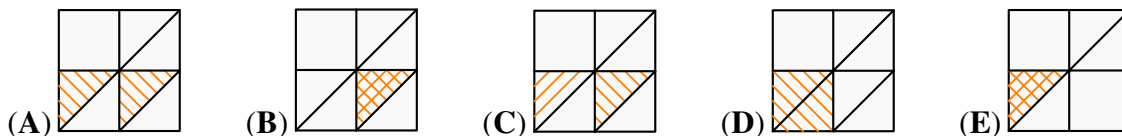
- (A) 25 cm (B) 50 cm (C) 75 cm (D) 1 m (E) 1.25 m



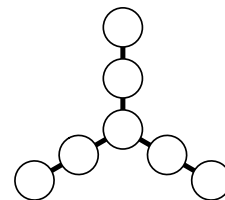
15. The picture shows a piece of transparent paper with a design drawn on it. The paper is then folded twice, as shown.



What would be seen on the folded paper?



16. 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

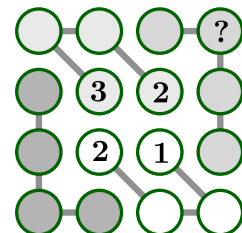
17. Werner chooses four of the numbers 2, 3, 4, 5 and 6 and writes one in each box so that the calculation is correct.

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

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

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

18. 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



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

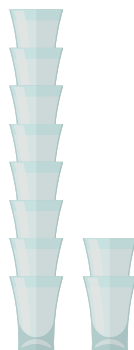
- (A) 2 kg (B) 3 kg (C) 4 kg (D) 5 kg (E) 6 kg

20. $A, B, C,$ and D are points on a line segment with $AB = 7, BC = 5, CD = 8, DA = 6$. Which two points are the beginning and at the end of this line segment?

- (A) A, B (B) A, C (C) B, D (D) C, D (E) A, D

PART C: EACH CORRECT ANSWER IS WORTH 5 POINTS

21. Some identical glasses are stacked on top of each other. A stack of 8 glasses is 42 cm high and a stack of 2 glasses is 18 cm high.











How high is a stack of 6 glasses?

- (A) 22 cm (B) 24 cm (C) 28 cm (D) 34 cm (E) 40 cm

22. In the picture below, each animal represents a positive integer and different animals represent different integers. The sum of the two integers in each column is written below that column.

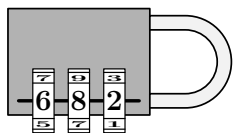
What is the largest possible sum of the four integers in the first row?

				?
				
15	11	3	7	

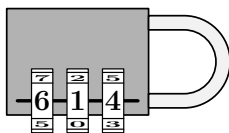
- (A) 18 (B) 19 (C) 20 (D) 21 (E) 22



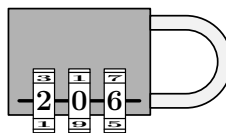
23. To unlock a given lock, you get the following four hints.



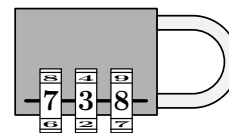
One of these digits is correct and in the right place.



One of these digits is correct but in the wrong place.



Two of these digits are correct but in the wrong place.



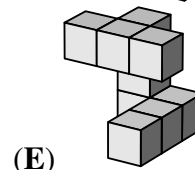
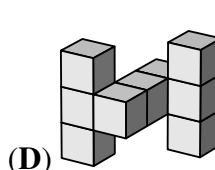
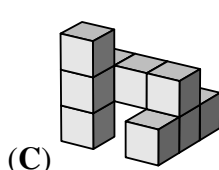
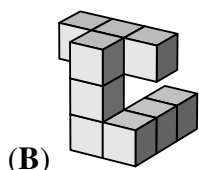
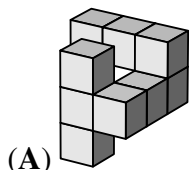
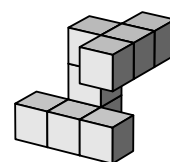
All of these digits are incorrect.

What is the correct code for the lock?

- (A) 604
- (B) 082
- (C) 640
- (D) 042
- (E) 046

24. Anna has the shape shown on the right.

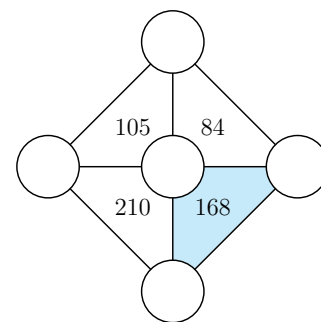
Which of the following shapes is the same as Anna's?



25. Four villages A, B, C and D lie along a road in that order. The distance between neighboring 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 traveled by the students when going to school is as short as possible. Where should they build the school?


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

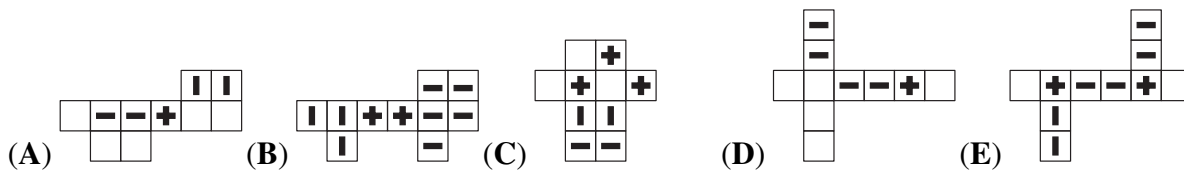
26. Elena wants to place five distinct single-digit numbers in the five circles so that the number inside each triangle is the product of the three numbers on its vertices. What is the sum of the three numbers on the vertices of the shaded triangle?



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

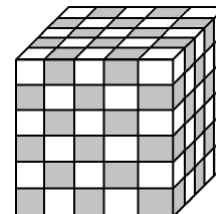


27. Which of the following nets cannot be folded into the solid  ?



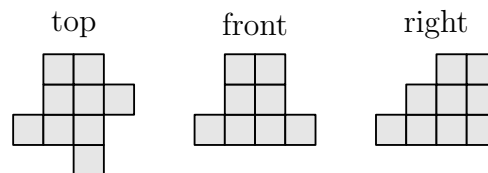
28. Joining small cubes of the same volume but of different material forms a rectangular box as shown in the figure.

If each white cube weighs 2 grams and each gray cube weighs 1 gram, how many grams does the box in the figure weigh?



- (A) 150 (B) 225 (C) 325 (D) 450 (E) 625

29. The three pictures show a structure made from identical 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. Thirty people are sitting around a circular table. Some of them are wearing hats. 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 greatest number of people who could be wearing a hat?

- (A) 5 (B) 10 (C) 15 (D) 20 (E) 25



CMKC 2022 Grade 5-6 Answers

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