



Kangaroo 2012 Cadet

(8th and 9th grade)

NAME _____ CLASS _____

Points: _____ Kangaroo leap: _____

Separate this answer sheet from the test.

Write your answer under each problem number.

For each wrong answer, 1/4 of the points of the problem will be deducted.

If you don't want to answer a question, leave the space empty and no deduction will be made.

PROBLEM	1	2	3	4	5	6	7
ANSWER							

PROBLEM	8	9	10	11	12	13	14
ANSWER							

PROBLEM	15	16	17	18	19	20	21
ANSWER							



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3 points

1.

A watch is placed face up on a table so that its minute hand points south. How many minutes pass before the minute hand points east for the first time?

- (A) 45 (B) 40 (C) 30 (D) 20 (E) 15

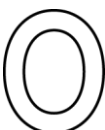


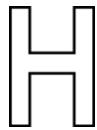

2.

Four chocolate bars cost 6 EUR more than one chocolate bar. What is the cost of one chocolate bar?

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

3.

Mary has a pair of scissors and five cardboard letters. She cuts each letter exactly once (along a straight line) so that it falls apart in as many pieces as possible. Which letter falls apart into the most pieces?

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

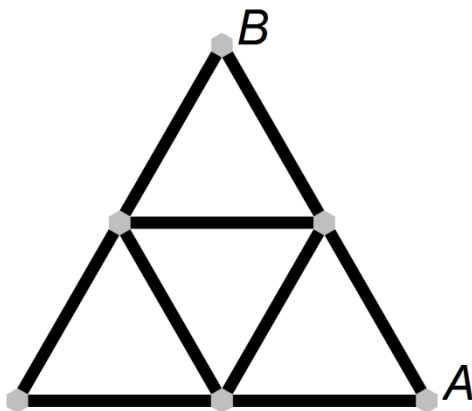
4.

A dragon has five heads. Every time a head is chopped off, five new heads grow. If six heads are chopped off one by one, how many heads will the dragon finally have?

- (A) 25 (B) 28 (C) 29 (D) 30 (E) 35

5.

Each of the nine paths in a park is 100 m long. Ann wants to go from A to B without walking along any path more than once. What is the length of the longest route she can choose?

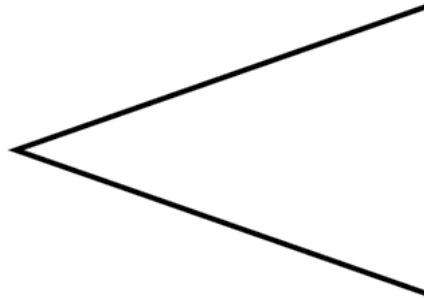
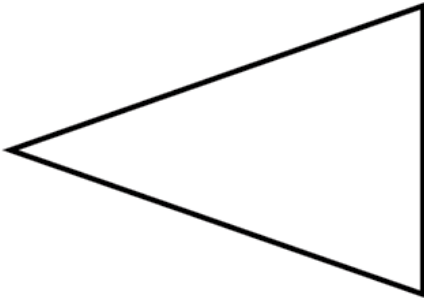


- (A) 900 m (B) 800 m (C) 700 m (D) 600 m (E) 400 m



6.

The diagram shows two triangles. In how many ways can you choose two vertices, one in each triangle, so that the straight line through the vertices does not cross either triangle?



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

7.

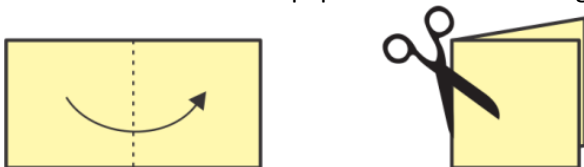
In which of the following expressions can we replace each occurrence of the number 8 by the same positive number (other than 8) and obtain the same result as here?

- (A) $(8 + 8) : 8 + 8$ (B) $8 \cdot (8 + 8) : 8$ (C) $8 + 8 - 8 + 8$
(D) $(8 + 8 - 8) \cdot 8$ (E) $(8 + 8 - 8) : 8$

4 points

8.

Werner folds a sheet of paper as shown in the figure and makes two straight cuts with a pair of scissors.



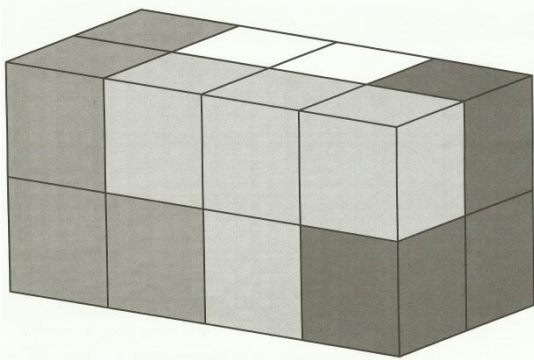
He then opens up the paper again. Which of the following shapes cannot be the result?

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

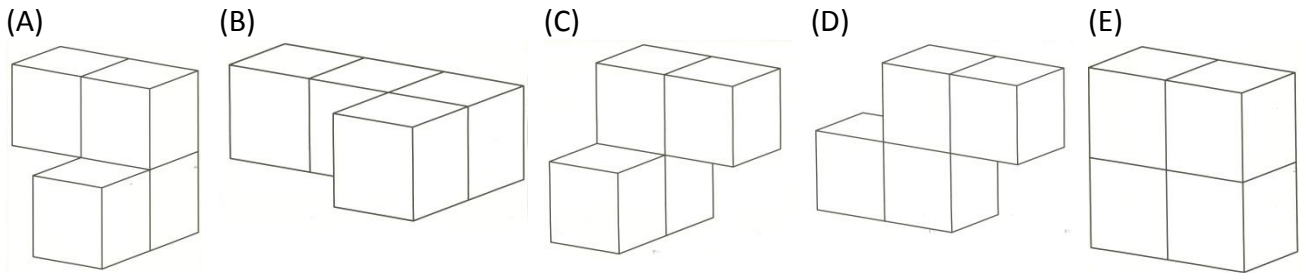


9.

A cuboid is made of four pieces, as shown.

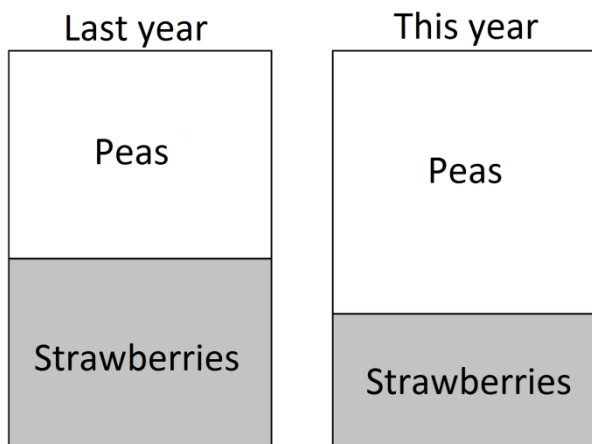


Each piece consists of four cubes and is of single colour. What is the shape of the white piece?



10.

Mrs Gardner grows peas and strawberries. This year she has changed the rectangular pea bed to a square by lengthening one of its sides by 3 metres. As a result of this change, the area of the strawberry bed was reduced by 15 m². What was the area of the pea bed before the change?

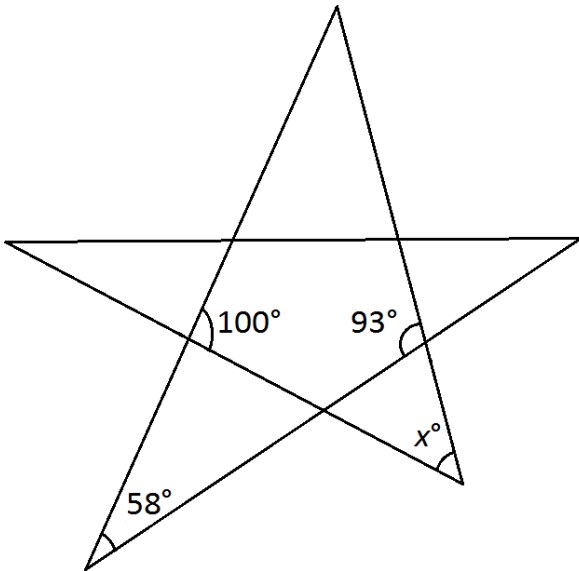


- (A) 5 m² (B) 9 m² (C) 10 m² (D) 15 m² (E) 18 m²



11.

In the figure, what is the value of x ?



- (A) 35 (B) 42 (C) 51 (D) 65 (E) 109

12.

A piece of cheese is cut into a large number of pieces. During the course of the day, a number of mice came and stole some pieces, watched by the lazy cat Ginger. Ginger noticed that each mouse stole a different number of pieces less than 10, and that no mouse stole exactly twice as many pieces as any other mouse. What is the largest number of mice that Ginger could have seen stealing cheese?

- (A) 4 (B) 5 (C) 6 (D) 7 (E) 8

13.

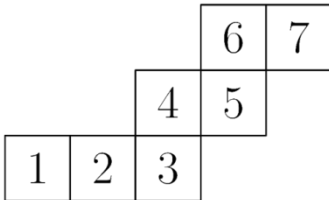
A magical talking square originally has sides of length 8 cm. If he tells the truth, then his sides become 2 cm shorter. If he lies, then his perimeter doubles. He makes four statements, two true and two false, in some order. What is the largest possible perimeter of the square after the four statements?

- (A) 28 cm (B) 80 cm (C) 88 cm (D) 112 cm (E) 120 cm



14.

A cube is rolled on a plane so that it turns around its edges. Its bottom face passes through the positions 1, 2, 3, 4, 5, 6, and 7 in that order, as shown.



Which two of these positions were occupied by the same face of the cube?

- (A) 1 and 7 (B) 1 and 6 (C) 1 and 5 (D) 2 and 7 (E) 2 and 6

5 points

15.

Rick has five cubes. When he arranges them from smallest to largest, the difference between the heights of any two neighbouring cubes is 2 cm. The largest cube is as high as a tower built from the two smallest cubes. How high is a tower built from all five cubes?

- (A) 6 cm (B) 14 cm (C) 22 cm (D) 44 cm (E) 50 cm

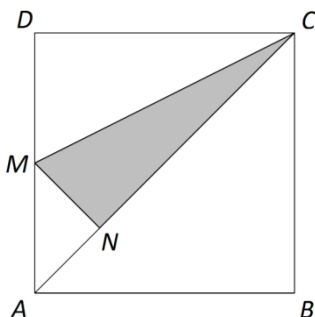
16.

At the airport there is a moving walkway 500 metres long, which moves with a speed of 4 km/hour. Ann and Bill step on the walkway at the same time. Ann walks with a speed of 6 km/hour on the walkway while Bill stands still. When Ann comes to the end of the walkway, how far is she ahead of Bill?

- (A) 100 m (B) 160 m (C) 200 m (D) 250 m (E) 300 m

17.

In the diagram $ABCD$ is a square, M is the midpoint of AD and MN is perpendicular to AC . What is the ratio of the area of the shaded triangle MNC to the area of the square?



- (A) 1 : 6 (B) 1 : 5 (C) 7 : 36 (D) 3 : 16 (E) 7 : 40



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18.

Some three-digit integers have the following property: if you remove the first digit of the number, you get a perfect square; if instead you remove the last digit of the number, you also get a perfect square. What is the sum of all the three-digit integers with this curious property?

- (A) 1013 (B) 1177 (C) 1465 (D) 1993 (E) 2016

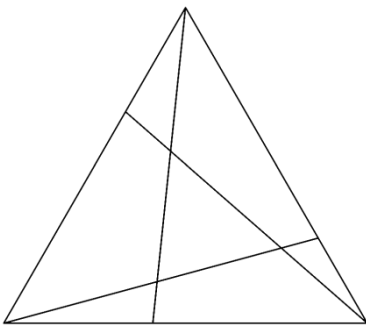
19.

A book contains 30 stories, each starting on a new page. The lengths of the stories are 1, 2, 3, ..., 30 pages. The first story starts on the first page. What is the largest number of stories that can start on an odd-numbered page?

- (A) 16 (B) 18 (C) 20 (D) 21 (E) 23

20.

A triangle is divided into four triangles and three quadrilaterals by three straight line segments as shown.

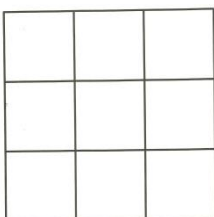


The sum of the perimeters of the three quadrilaterals is equal to 25 cm. The sum of the perimeters of the four triangles is equal to 20 cm. The perimeter of the whole triangle is equal to 19 cm. What is the sum of the lengths of the three straight line segments?

- (A) 11 cm (B) 12 cm (C) 13 cm (D) 15 cm (E) 16 cm

21.

A positive number is to be placed in each cell of the 3 x 3 grid shown, so that: in each row and each column, the product of the three numbers is equal to 1; and in each 2 x 2 square, the product of the four numbers is equal to 2. What number should be placed in the central cell?



- (A) 16 (B) 8 (C) 4 (D) $\frac{1}{4}$ (E) $\frac{1}{8}$