Kangaroo 2018 Cadet

(8th and 9th grade)

Maunulan yhteiskoulu
HELSINGIN MATEMATIIKKALUKIO

NAME _____ CLASS _____

Points: _____ Kangaroo leap: _____

Separate this answer sheet from the test. Write your answer under each problem number.

For each right answer you get 3, 4, or 5 points. There is exactly one correct answer for each problem.

For each wrong answer, ¼ of the points of the problem will be deducted, for example for a 4-point problem -1 point. If you leave the answer empty, no deduction will be made.

There are two goals: to get as many points as possible, or to get as many consecutive right answers as possible.

3 points

PROBLEM	1	2	3	4	5	6	7
ANSWER							

4 points

PROBLEM	8	9	10	11	12	13	14
ANSWER							

5 points

PROBLEM	15	16	17	18	19	20	21
ANSWER							

Contest not to be held before 15th of March.

Logo design by Veijo Nurminen.

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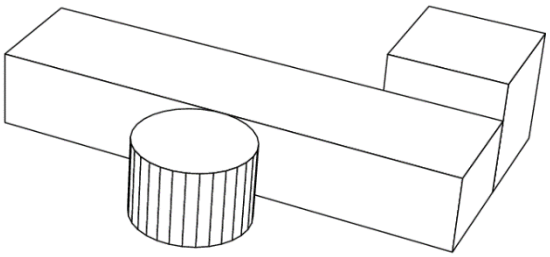
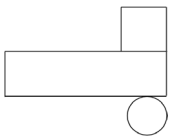
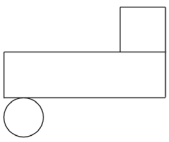
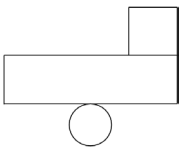
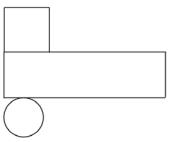
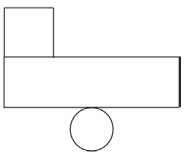
3 points

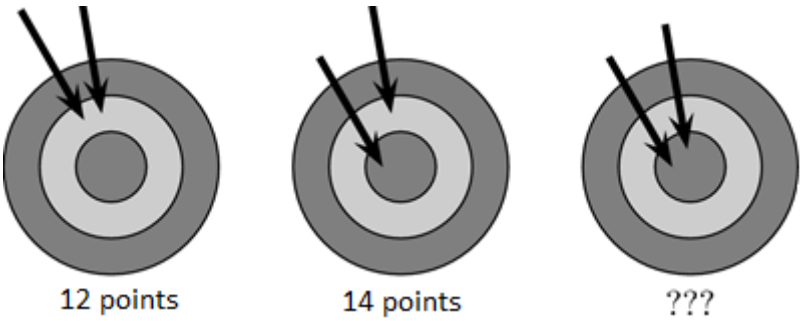
1.
There are three objects on the table.



What does Peter see if he looks at the table from above?

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

2.
Diana shot two arrows twice. The first time she scored 12 points. The second time she scored 14 points. How many points did she score the third time?



(A) 16 (B) 18 (C) 20 (D) 22 (E) 24

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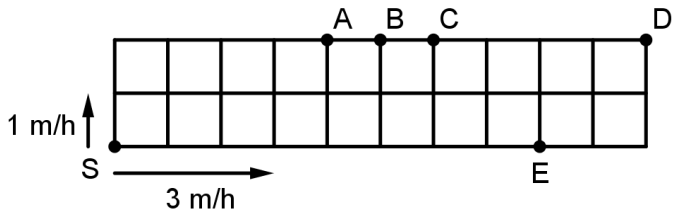
3.

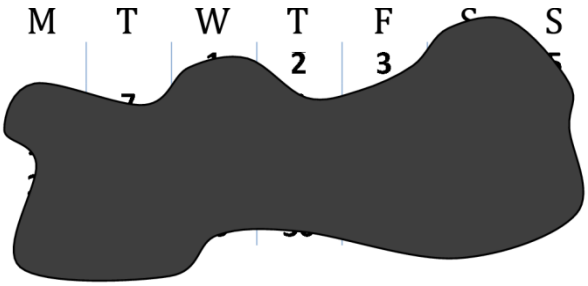
A garden is divided into identical squares, the side of which is 1 m. A fast and a slow snail move along the perimeter of the garden starting from the corner S but in different directions. The slow snail moves at the speed of 1 m/h and the fast one at 3 m/h. At what point will the two snails meet?



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

4.

The picture shows the calendar of a certain month. Unfortunately an ink spot covers most of the dates. What day is the 26th of that month?



(A) Monday
(B) Wednesday
(C) Thursday
(D) Saturday
(E) Sunday

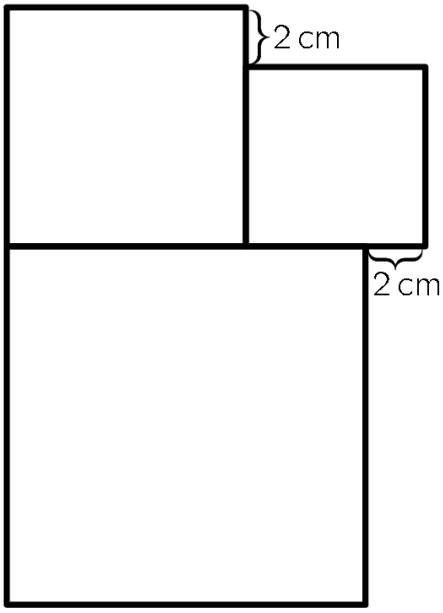
5.

The second floor of the house is 3 m above the first floor. On how many stairs does Pete step on while climbing from the first floor to the second floor? The height of each stair is 15 cm. Neither the first nor the second floor count as a stair.

(A) 16 (B) 17 (C) 18 (D) 19 (E) 20

6.

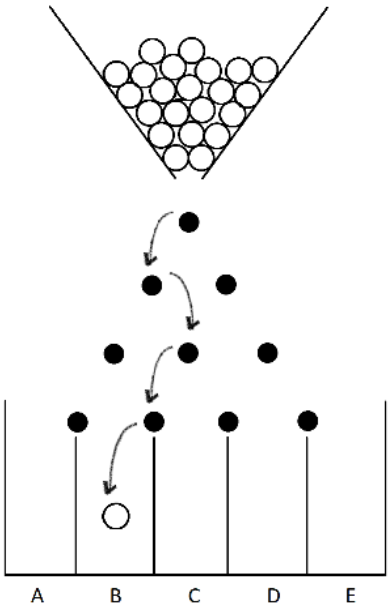
There are 3 squares in the figure. The side length of the smallest square is 6 cm. What is the side length of the biggest square?



(A) 8 cm (B) 10 cm (C) 12 cm (D) 14 cm (E) 16 cm

7.

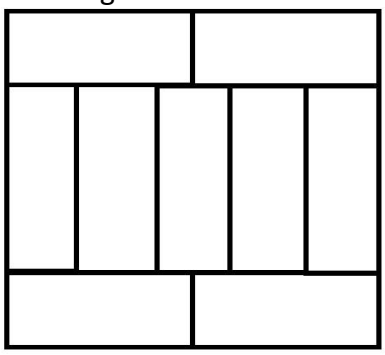
The ball bounces either to the right or to the left each time it hits a pin. One possible route for the ball is shown below. How many different routes could the ball take to reach bin B?



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

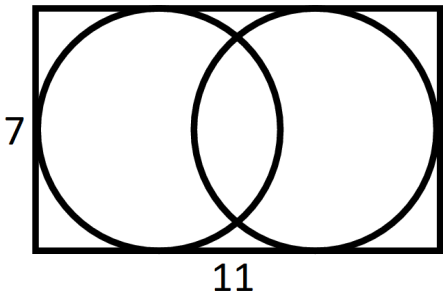
4 points

8.
A large rectangle is made up of nine identical rectangles whose longest sides are 10 cm long. What is the perimeter of the large rectangle?



(A) 72 cm (B) 76 cm (C) 80 cm (D) 84 cm (E) 88 cm

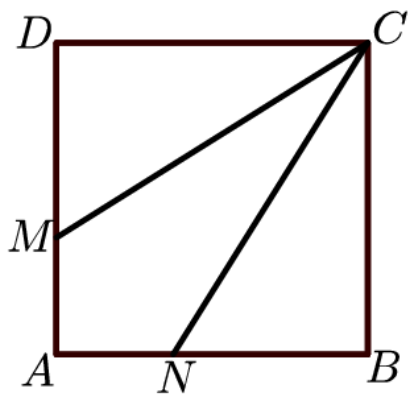
9.
The diagram shows a rectangle of dimensions 7 × 11 containing two circles that both touch three of the sides of the rectangle. What is the distance between the centres of the two circles?



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

10.

Square $ABCD$ has sides of length 3,0 cm. The points M and N lie on AD and AB so that CM and CN split the square into three parts with equal areas. What is the length of DM?



(A) 0,5 cm (B) 1,0 cm (C) 1,5 cm (D) 2,0 cm (E) 2,5 cm

11.

A rectangle is divided into 40 identical squares. The rectangle consists of more than one row of squares. Andrew coloured the middle row of the squares. How many squares did he not colour?

(A) 32 (B) 36 (C) 40 (D) 44 (E) 48

12.

Philip wants to know the weight of a book with an accuracy of half a gram. The accuracy of Philip's scale is 10 grams. What is the smallest number of identical copies of this book that Philip should weigh together to be able to do this?

(A) 5 (B) 10 (C) 15 (D) 20 (E) 50

13.

A lion is hidden in one of three rooms.
A note on the door of room 1 reads "The lion is here".
A note on the door of room 2 reads "The lion is not here".
A note on the door of room 3 reads "2 + 3 = 2 × 3".
Only one of these sentences is true. In which room is the lion hidden?

(A) In room 1. (B) In room 2. (C) In room 3. (D) It might be in any room. (E) It might be in either room 1 or room 2.

14.

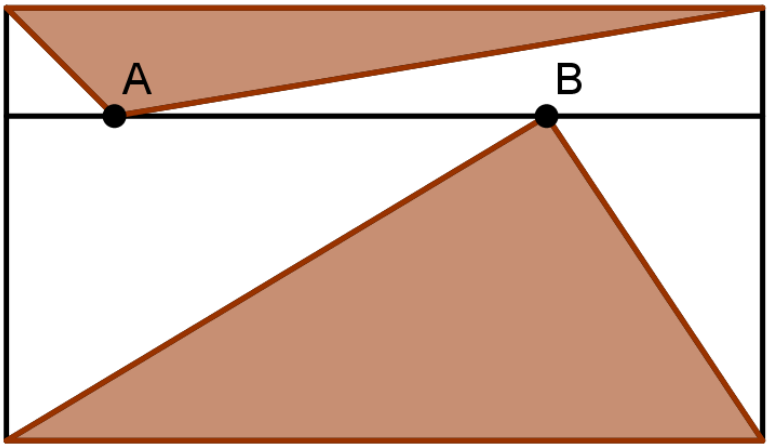
A hotel on an island advertises using the slogan "350 days of sun every year''. Willi Burn arrives to the island today and is determined to stay there for two consecutive sunny days. According to the ad, how many days does he have to stay at the island, if he has the worst possible luck?

(A) 17 (B) 21 (C) 30 (D) 31 (E) 32

5 points

15.

The diagram shows a rectangle. Line AB is parallel to the base of the rectangle. The sum of the areas of the two shaded triangles is 10 cm^2. What is the area of the rectangle?



(A) 18 cm^2 (B) 20 cm^2 (C) 22 cm^2 (D) 24 cm^2 (E) It depends on the positions of A and B.

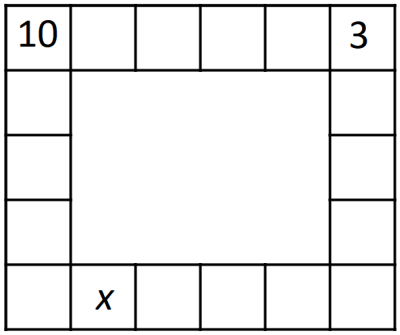
16.

Eleven points are marked from left to right on a straight line. The sum of all the distances between the first point and the other points is 2018. The sum of all the distances between the second point and the other points, including the first one, is 2000. What is the distance between the first and the second point?

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

17.

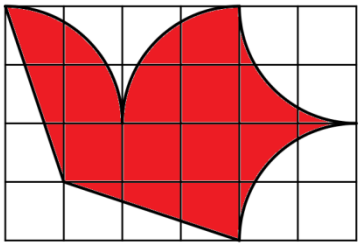
Ria wants to write a number in every cell in the picture. She has already written two numbers. In each cell, the number she writes is equal to the sum of the two numbers in the neighbouring cells. (Cells are neighbours if they share a side.) What number should Ria write in the cell marked x?



(A) –13 (B) –3 (C) 7 (D) 10 (E) 13

18.

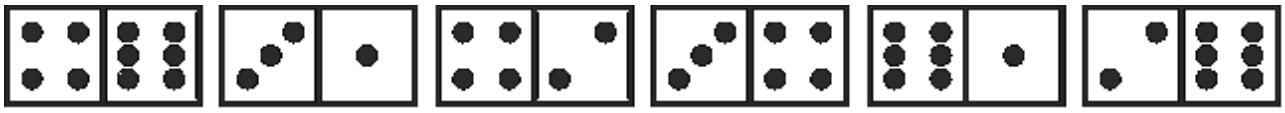
Freda's flying club designed a flag of a flying dove on a square grid as shown. The area of the dove is 192 cm^2. All parts of the perimeter of the dove are either parts of a circle or straight lines. What are the dimensions of the flag?



(A) 6 cm x 4 cm (B) 12 cm x 8 cm (C) 20 cm x 12 cm (D) 24 cm x 16 cm (E) 30 cm x 20 cm

19.

Domino tiles are arranged correctly if the number of spots in the touching ends of adjacent dominoes are the same. Paulius laid six dominoes in a line as shown in the picture. He can make a move by either swapping the position of any two dominoes or by rotating one domino. What is the smallest number of moves he needs to make to arrange all the tiles correctly?



(A) 1 (B) 2 (C) 3 (D) 4 (E) That is impossible to do.

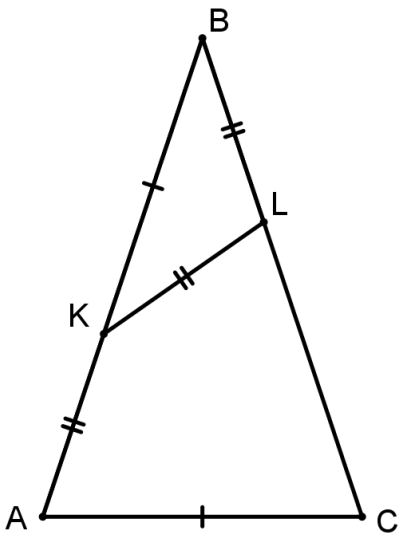
20.

Viola is practising long jump. The average distance she has jumped so far today is 4.80 m. On her next jump, she jumps 4.99 m and her average increases to 4.81 m. After that, she will jump for the last time. What distance must she jump with her last jump to increase her average to 4.82 m?

(A) 4.97 m (B) 4.98 m (C) 4.99 m (D) 5.00 m (E) 5.01 m

21.

In isosceles triangle ABC, points K and L are marked on sides AB and BC respectively so that $AK = KL = LB$ and $KB = AC$. What is the size of angle ABC?



(A) 36° (B) 38° (C) 40° (D) 41° (E) 42°