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							

3 points

1.
Pasi wants to paint the slogan VIVAT KANGAROO on a wall. He wants different letters to be coloured differently, and the same letters to be coloured identically. How many colours will he need?

(A) 7 (B) 8 (C) 9 (D) 10 (E) 13

2.
Sally can put 4 coins in a square built with 4 matches (see picture). At least how many matches will she need in order to build in a similar way a square containing 16 coins?

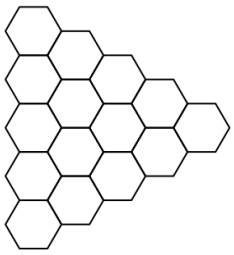
(A) 8 (B) 10 (C) 12 (D) 15 (E) 16

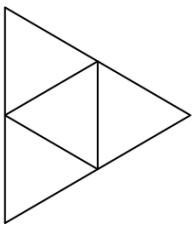
3.
In a plane, the rows are numbered from 1 to 25, but there is no row number 13. Row number 15 has only 4 passenger seats, all the rest have 6 passenger seats. How many seats for passengers are there in the plane?

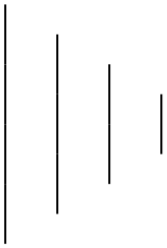
(A) 120 (B) 138 (C) 142 (D) 144 (E) 150

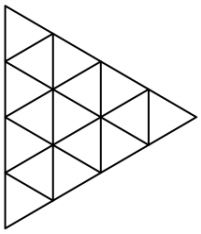
4.

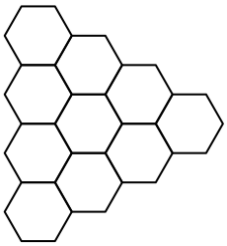
The picture shows a pattern of hexagons. We draw a new pattern by connecting all the midpoints of any neighbouring hexagons. What pattern do we get? (Hexagons are neighbours if they share a common side.)

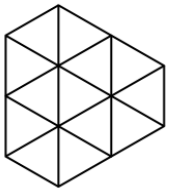


(A) 

(B) 

(C) 

(D) 

(E) 

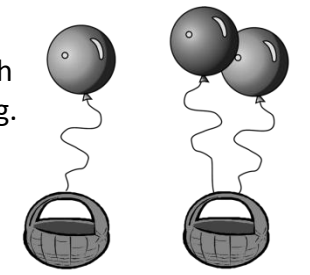
5.

When it is 4 o'clock in the afternoon in London, it is 5 o'clock in the afternoon in Madrid and it is 8 o'clock in the morning on the same day in San Francisco. Ann went to bed in San Francisco at 9 o'clock yesterday evening. What was the time in Madrid at that moment?

(A) 6 o'clock yesterday morning
(B) 6 o'clock yesterday evening
(C) 12 o'clock yesterday noon
(D) 12 o'clock midnight
(E) 6 o'clock this morning

6.

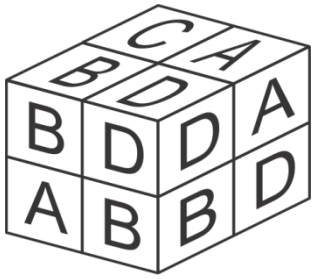
One balloon can lift a basket containing items weighing at most 80 kg. Two such balloons can lift the same basket containing items weighing at most 180 kg. What is the weight of the basket?



(A) 10 kg (B) 20 kg (C) 30 kg (D) 40 kg (E) 50 kg

7.

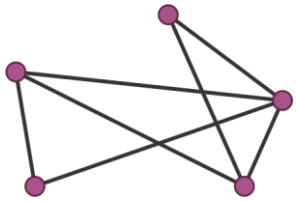
Lisa has 8 dice with the letters A, B, C and D, the same letter on all sides of each die. She builds a cube with them. Two adjacent dice always have different letters. If a die is on top of another one, then the two dice also have different letters. What letter is on the die that cannot be seen in the picture?



(A) A (B) B (C) C (D) D (E) impossible to say

4 points

8.
There are five cities in Wonderland. Each pair of cities is connected by one road, either visible or invisible. On the map of Wonderland, there are only seven visible roads, as shown. Alice has magical glasses: when she looks at the map through these glasses she only sees the roads that are otherwise invisible. How many invisible roads can she see?

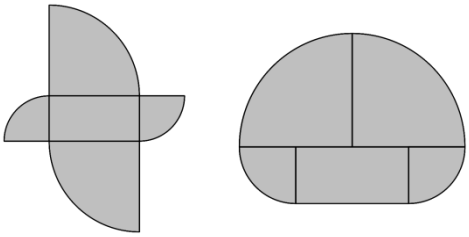


(A) 2 (B) 3 (C) 7 (D) 8 (E) 9

9.
Viivi and Mika were given some apples and pears by their grandmother. They had 25 pieces of fruit in their basket altogether. On the way home Viivi ate 1 apple and 3 pears, and Mika ate 3 apples and 2 pears. At home they found out that they brought home the same number of pears as apples. How many pears were they given by their grandmother?

(A) 12 (B) 13 (C) 16 (D) 20 (E) 21

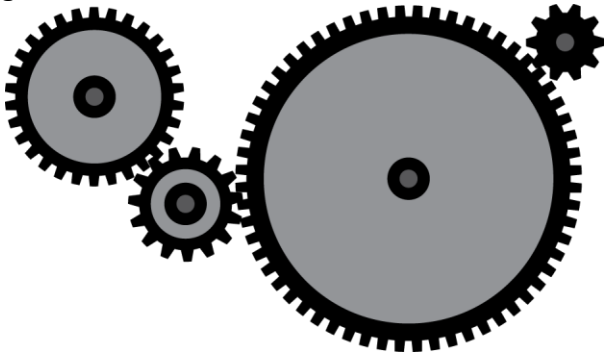
10.
Both shapes (see pictures) are formed from the same five pieces. The rectangle measures 5 cm x 10 cm, and the other parts are quarters of two different circles. The difference between the perimeter lengths of the two shapes is



(A) 2,5 cm (B) 5 cm (C) 10 cm (D) 20 cm (E) 30 cm

11.

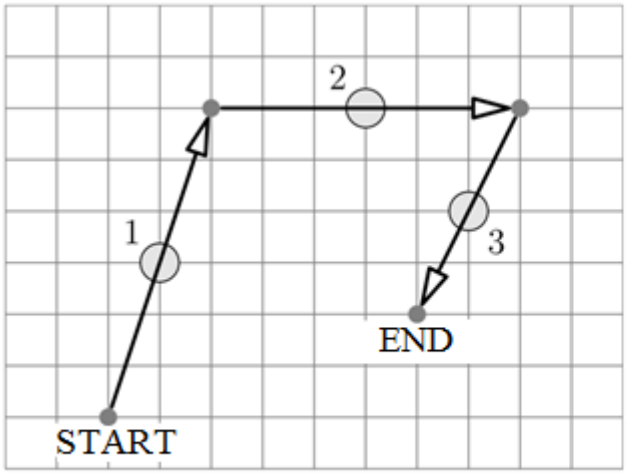
There are 4 gearwheels on fixed axles next to each other, as shown. The first one has 30 gears, the second one 15, the third one 60 and the last one 10. How many revolutions does the last gearwheel make, when the first one turns through one revolution?



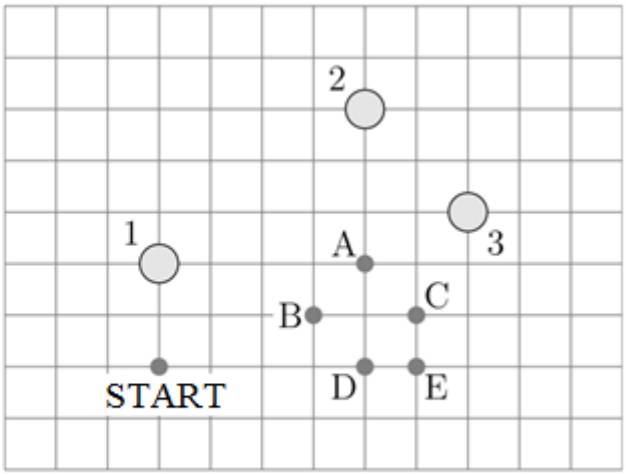
(A) 3 (B) 4 (C) 6 (D) 8 (E) 9

12.

Kangaroos Hip and Hop play jumping by hopping over a stone, then landing across so that the stone is in the middle of the segment traveled during each jump. Picture 1 shows how Hop jumped three times hopping over stones marked 1, 2 and 3. Hip has the configuration of stones marked 1, 2 and 3 (to jump over in this order), but starts in a different place as shown on Picture 2. Which of the points A, B, C, D or E is his landing point?



Picture 1: Hop

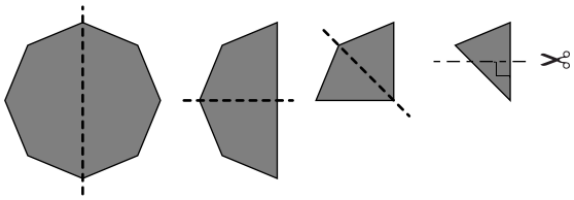


Picture 2: Hip

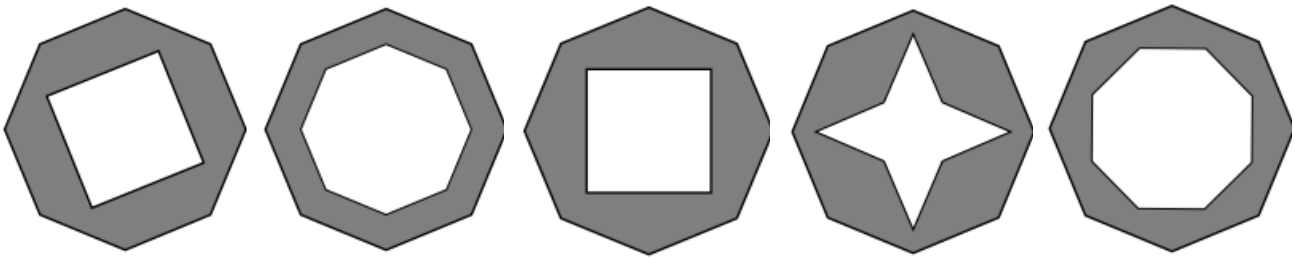
(A) A (B) B (C) C (D) D (E) E

13.

A regular octagon is folded in half exactly three times until a triangle is obtained, as shown. Then the apex is cut off at right angles, as shown in the picture. If the paper is unfolded, what will it look like?

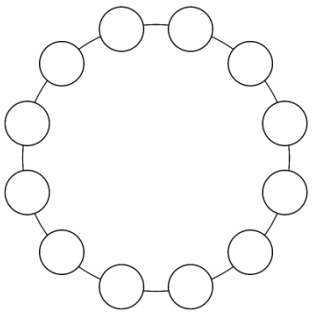


(A) (B) (C) (D) (E)



14.

A kangaroo wants to arrange the twelve numbers from 1 to 12 in a circle such that any neighbouring numbers always differ by either 1 or 2. Which of the following pairs of numbers have to be neighbours?



(A) 5 and 6 (B) 10 and 9 (C) 6 and 7 (D) 8 and 10 (E) 4 and 3

5 points

15.

There were twelve children at a birthday party. Each child was either 6, 7, 8, 9 or 10 years old, with at least one child of each age. Four of them were 6 years old. In the group the most common age was 8 years old. What was the average age of the twelve children?

(A) 6 (B) 6,5 (C) 7 (D) 7,5 (E) 8

16.
The positive integers have been coloured red, blue or green: 1 is red, 2 is blue, 3 is green, 4 is red, 5 is blue, 6 is green, and so on. Raisa calculates the sum of a red number and a blue number. What colour can the resulting number be?

(A) impossible to say (B) red or blue (C) only green
(D) only red (E) only blue

17.
A rubber ball falls vertically through a height of 10 m from the roof of a house. After each impact on the ground it bounces back up to 4/5 of the previous height. How many times will the ball appear in front of a rectangular window whose bottom edge has a height of 5 m and whose top edge has a height of 6 m?

(A) 3 (B) 4 (C) 5 (D) 6 (E) 8

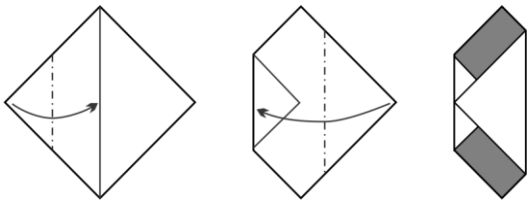
18.
Petri wants to cut a rectangle of size 6 x 7 into squares with integer sides. What is the minimum number of squares he can get?

(A) 4 (B) 5 (C) 7 (D) 9 (E) 42

19.
Some cells of the square table of size 4 x 4 were colored red. The number of red cells in each row was indicated at the end of it, and the number of red cells in each column was indicated at the bottom of it. Then the red colour was eliminated. Which of the following tables can be the result?

(A) 4 2 1 1 / 0 3 3 2 (B) 1 2 1 3 / 2 2 3 1 (C) 3 3 0 0 / 1 3 1 1 (D) 2 1 2 2 / 2 1 2 2 (E) 0 3 3 1 / 0 3 1 3

20.
A square-shaped piece of paper has an area of 64 cm^2. The square is folded twice as shown in the picture. What is the sum of the areas of the shaded rectangles?



(A) 10 cm^2 (B) 14 cm^2 (C) 15 cm^2 (D) 16 cm^2 (E) 24 cm^2

21.

I give Anni and Pietari two consecutive positive integers (for instance Anni 7 and Pietari 6). They know their numbers are consecutive, they know their own number, but they do not know the number I gave to the other one. Then I hear the following discussion:
Anni says to Pietari: "I don't know your number."
Pietari says to Anni: "I don't know your number."
Then Anni says to Pietari: "Now I know your number! Number 20 is divisible by it!"
What is Annis number?

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