2006

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EUROPEAN KANGAROO
ARITHMETIC AND MATHEMATICS CONTEST

Welcome to the Kangaroo, great that you join in!

* You have 50 minutes. There are 24 questions. With every question one of the five options is the correct one.
* Do what you can, don't be disappointed if you cannot answer everything.
* You are not allowed to use a calculator; of course you may use scribbling paper.
* Use a pencil to fill in the answer sheet carefully.
* About scoring points:
  * You start with 30 free points.
  * Question 1 - 10: you will get 3 points for a correct answer; you will lose ¾ points for an incorrect one.
  * Question 11 - 20: you will get 4 points for a correct answer; you will lose 1 point for an incorrect one.
  * Question 21 - 24: you will get 5 points for a correct answer; you will lose 1¼ points for an incorrect one.
  * If you don't answer a question, you neither gain nor lose points.
* The answers will be on the website from March 22nd, **www.math.ru.nl/kangoeroe**
* The scores and the prizes will arrive at schools in week 17.

Good luck and most of all: have fun!!

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the Netherlands: 7 & 8 primary school and 1 & 2 vmbo
Flanders: 5 & 6 primary school and bso 1st degree

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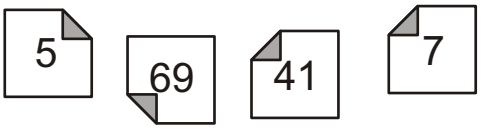
01. 3 x 2006 = 2005 + 2007 + ?
What should the question mark be replaced by?

A. 2005 **B.** 2006 **C.** 2007 **D.** 2008 **E.** 2009

02. We place the four number cards in a row.
What is the largest number we can make?

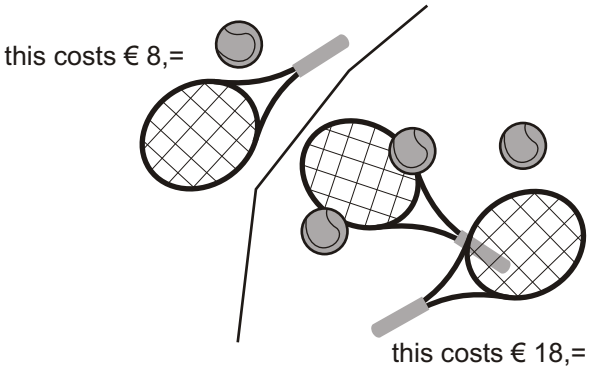


A. 415769 **B.** 694175 **C.** 756941 **D.** 769541 **E.**796541

03. There are three square tables. Four people can sit at each table.
The three tables form one long table.
How many persons can be seated around this long table?

A. 6 **B.** 8 **C.** 9 **D.** 10 **E.** 16

04. How many euros does one tennis ball cost?

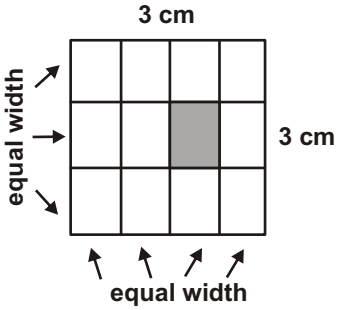


A. 1 **B.** 2 **C.** 3 **D.** 4 **E.** 5

05. Harry and Ron have a drink together. Harry drinks 8 glasses of soft drink, Ron 7.
Together these soft drinks cost 30 euros. Both boys pay for their own drinks.
How many euros does Harry pay?

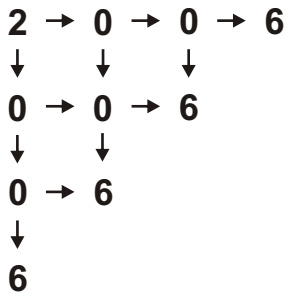
A. 14 **B.** 15 **C.** 16 **D.** 18 **E.** 20

06. A square measuring 3 by 3 cm is divided in parts.
What is the area in cm^2 of the grey region?



A. $\frac{1}{12}$ **B.** $\frac{1}{4}$ **C.** $\frac{1}{2}$ **D.** $\frac{3}{4}$ **E.** 1

07. You start at 2 and follow the arrows.
Arriving at 6, you have formed the number 2006.
In how many ways can you form 2006 like this?



A. 7 **B.** 8 **C.** 9 **D.** 10 **E.** 11

08. How much is half of $\frac{1}{10}$?

A. 0,05 **B.** 0,1 **C.** 0,2 **D.** 0,25 **E.** 0,5

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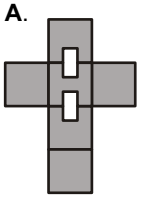
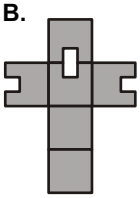
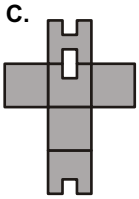
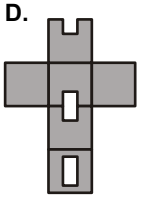
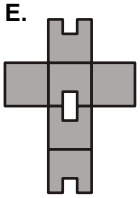
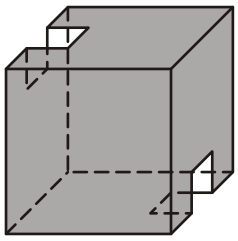
09. The hollow cube has two holes.
Which one is the net of this cube?

A.  **B.**  **C.**  **D.**  **E.** 



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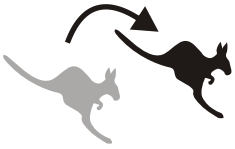
10. A kangaroo makes two equal jumps on the number line.
Which jumps could he have made?



A. ½ → ¾ → 1 **B.** 0,3 → 0,7 → 1,3 **C.** ⅕ → ¼ → ⅓
D. 12 → 21 → 32 **E.** 24 → 48 → 64

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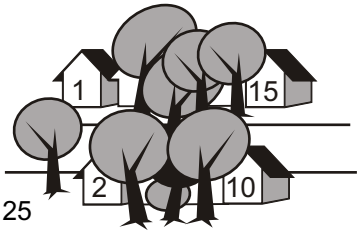
11. The houses on one side of Main Street have the odd numbers from 1 to 15, inclusive.
The houses on the other side of the road have the even numbers from 2 to 10, inclusive.
How many houses are there along Main Street?



A. 10 **B.** 12 **C.** 13 **D.** 15 **E.** 25

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12. A 15 dm long rope is cut in pieces. The length of every piece is a whole number of dm.
All lengths are different.
How many times can you cut the rope at most?

A. 3 **B.** 4 **C.** 5 **D.** 6 **E.** 15

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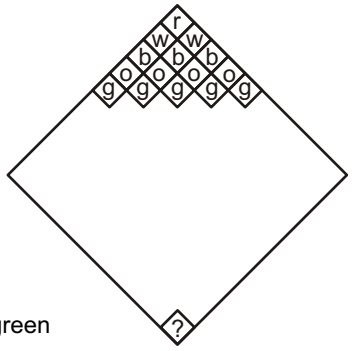
13. A square consists of 10 by 10 small squares.
The small squares are coloured row by row: red, white, blue, orange, green, red, white, blue, orange, green, and so on.
What is the colour of the bottom square?



A. red **B.** white **C.** blue **D.** orange **E.** green

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14. Harry adds the even numbers 2, 4, 6, until 40 (inclusive).
Hermione adds the odd numbers 1, 3, 5, until 39 (inclusive).
How much is the difference between their answers?

Harry:
2 + 4 + 6 + ... + 40

Hermione:
1 + 3 + 5 + ... + 39

A. 1 **B.** 4 **C.** 10 **D.** 20 **E.** 40

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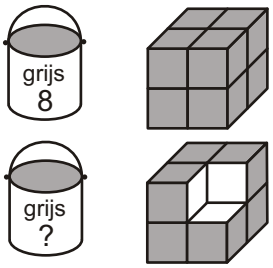
15. To paint the cube grey (including the bottom) Harry needed 8 litres of paint.
Harry removes one small block.
How much paint does he need to paint the white part?



A. 1 **B.** 1½ **C.** 2 **D.** 2½ **E.** 3

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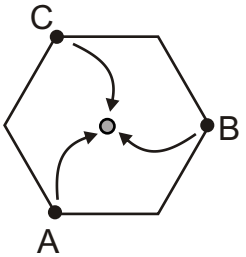
16. Ron folds the vertices A, B, and C to the dot in the middle.
Which shape does Ron get?



A. triangle **B.** square **C.** hexagon **D.** hexagonal star
E. 12-sided polygon

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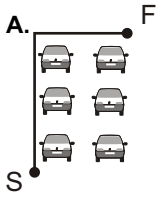
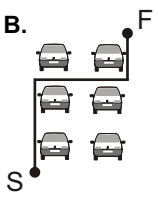
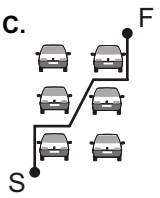
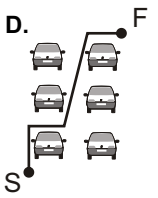
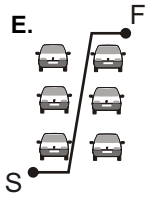
17. Six cars are parked in a parking lot. Harry would like to walk from S to F.
His route should be as short as possible.
Which of the following routes should he take?

A. 

B. 

C. 

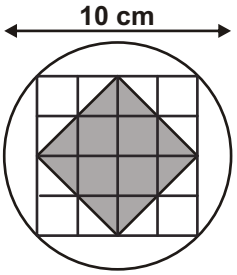
D. 

E. 

18. A cube is being painted in 2 colours.
Two faces are painted blue, the other four faces will be red.
How many different cubes can be made?

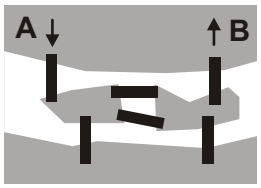
A. 2 **B.** 3 **C.** 4 **D.** 5 **E.** 6

19. The circle has a 10 cm diameter.
A square fits precisely in the circle, and inside it a grey square is drawn.
What is the perimeter of the grey square in cm?



A. 8 **B.** 16 **C.** 20 **D.** 25 **E.** 30

20. A river flows through a city. There are two islands in the river.
There are six bridges. Hermione would like to walk from A to B.
She would like to cross every bridge exactly once.
How many routes can Hermione choose from?

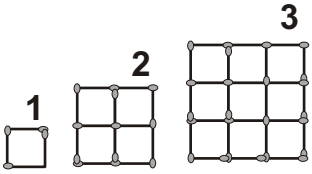


A. 2 **B.** 3 **C.** 4 **D.** 5 **E.** 6

21. Hermione takes the largest even three-digit number and the smallest even two-digit number.
She adds those.
Harry takes the largest odd three-digit number and the smallest odd two-digit number.
He adds those.
What is the difference between their results?

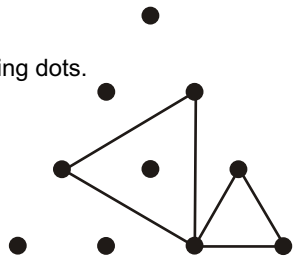
A. 0 **B.** 1 **C.** 2 **D.** 3 **E.** 4

22. Hermione forms squares with matches.
The picture shows squares 1, 2, and 3.
How many matches does square 10 have?



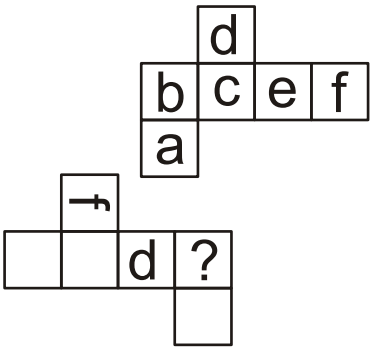
A. 100 **B.** 110 **C.** 180 **D.** 200 **E.** 220

23. By connecting dots in the picture, you can draw equilateral triangles.
Two examples have been drawn. Harry is going to erase dots.
It should become impossible to draw equilateral triangles between the remaining dots.
What is the least number of dots Harry will have to erase?



A. 2 **B.** 3 **C.** 4 **D.** 5 **E.** 6

24. Letters have been written on the faces of a cube.
Alongside you see two nets of this cube.
Which letter should replace the question mark?



A. a **B.** b **C.** c **D.** e
E. more than one letter possible