

# WIZPROF 2012

## W4 KANGOEROE Wereldwijde Wiskunde Wedstrijd



[www.w4kangoeroe.nl](http://www.w4kangoeroe.nl)  
Good luck and most of  
all have fun.



calculator not  
allowed



you may use  
75 minutes



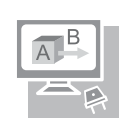
scrap paper  
is allowed



results and awards  
at school mid-May



20th March the  
answers will be on  
the website



15th April the  
explanations will be  
on the website

wizPROF  
havo 4 & 5  
vwo 3, 4, 5 & 6

Zwijsen  
[www.zwijsen.nl](http://www.zwijsen.nl)

NEMO  
[www.e-nemo.nl](http://www.e-nemo.nl)  
GETAL & RUIMTE  
[www.getalenuimte.epn.nl](http://www.getalenuimte.epn.nl)

TEXAS INSTRUMENTS  
[www.education.ti.com](http://www.education.ti.com)

SMART GAMES  
[www.smart.be](http://www.smart.be)

Rekenzeker  
[www.rekenzeker.nl](http://www.rekenzeker.nl)

Sanders  
[www.sanderspuzzelboeken.nl](http://www.sanderspuzzelboeken.nl)

Schoolsupport  
[www.schoolsupport.nl](http://www.schoolsupport.nl)

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[www.idpremiums.nl](http://www.idpremiums.nl)

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UITGEVERIJ NIEUWEZIJD  
[www.nieuwezijds.nl](http://www.nieuwezijds.nl)

platform wiskunde nederland  
[www.platvormwiskunde.nl](http://www.platvormwiskunde.nl)

ZO?! ZIT DAT  
[www.zozitdat.nl](http://www.zozitdat.nl)

Denksport

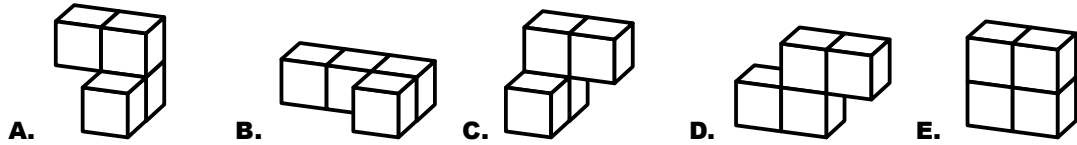
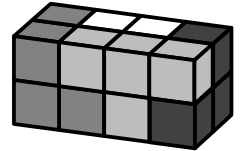
CITO  
[www.cito.nl](http://www.cito.nl)

MUSEUM BOERHAAVE  
[www.museumboerhaave.nl](http://www.museumboerhaave.nl)

1.  $11,11 - 1,111 =$

- A. 9,009      B. 9,0909      C. 9,99      D. 9,999      E. 10

2. A cuboid consists of four pieces of four blocks each. Each piece has its own colour. Which one is the white piece?



3. When you divide the numbers 144 and 220 by the same positive number the remainder is 11 in both cases. Which number did you divide by?

- A. 7      B. 11      C. 15      D. 19      E. 38

4. Anna sends Bart a message coded as follows:  
Each letter is represented by a number: A = 01, B = 02, C = 03, ..., Z = 26.  
Then every number is replaced by the outcome of  $2 \times \text{number} + 9$ . The sequence of outcomes is sent to Bart. He received the sequence 25, 39, 19, 38 and wants to decipher the sequence. Which message does Bart find?

- A. HEMD      B. HOED      C. HOOP      D. NOOD  
E. None: Anna made a mistake

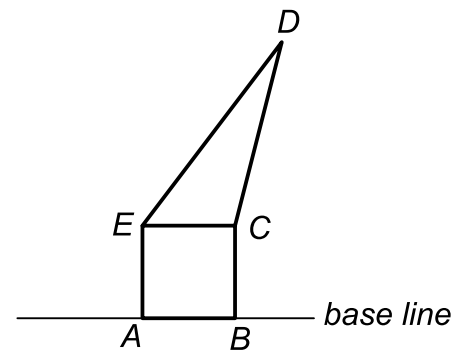
5. The sum of the digits of a seven-digit number is 6. What is the product of the digits?

- A. 0      B. 1      C. 6      D. 7      E. 42

6. On each of the four walls of a room a clock is hanging, but none of them shows the exact time. The first clock is off by 2 minutes, the second clock by 3 minutes, the third by 4 minutes and the fourth by 5 minutes. At a certain moment, watching all four clocks, Ismael sees the times 6 to 3, 3 to 3, 2 past 3 and 3 past 3. What is the time then?

- A. 2:55      B. 2:56      C. 2:57      D. 2:58      E. 2:59

7. Square  $ABCE$  has sides of 4 cm. Triangle  $CDE$  and square  $ABCE$  have equal area. How many cm is point  $D$  from the base line?

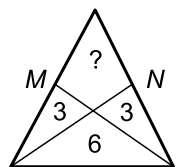


- A.  $(4 + 2\sqrt{3})$       B. 8      C. 12  
D.  $10\sqrt{2}$       E. That depends on the position of  $D$ .

8. The arms of the right angle of a right-angled triangle are 6 and 8 cm long.  $K$ ,  $L$  and  $M$  are the midpoints of the sides. How many cm is the perimeter of triangle  $KLM$ ?

- A. 10      B. 12      C. 15      D. 20      E. 24

9.  $M$  and  $N$  are the midpoints of the equal sides of an isosceles triangle. The areas of three parts are in the picture alongside. What is the area of the part with the question mark?



- A. 3      B. 4      C. 5      D. 6      E. 7

10. A quadrilateral has sides of length 1 and 4, the lengths of the other two sides are unknown. The quadrilateral is divided into two isosceles triangles by one of its diagonals. This diagonal has length 2. What is the perimeter of the quadrilateral?

- A. 9      B. 10      C. 11      D. 12      E. 13

11. If Luke stands on a table and Danny stands on the floor then Luke rises 80 cm above Danny. If Danny stands on the same table and Luke stands on the floor then Danny rises one metre above Luke. What is the height of the table in cm?

A. 20                      B. 80                      C. 90                      D. 100                      E. 120

12. Julia and Emma are playing a game. If Emma wins, Julia has to pay her 2 euros. If Julia wins, Emma has to pay her 3 euros. After playing thirty games, both girls have the same amount of money they started with. How many times did Julia win?

A. 6                      B. 12                      C. 18                      D. 24                      E. 30

13. A four-digit number has a 3 on the position of the hundreds. The sum of the other digits is 3 as well. How many such numbers are there?

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

14. Three girls are doing a running contest. Four spectators make a prediction each. The first one : "Lisa or Sophie will win." The second one: "If Sophie comes second, then Rachida wins." The third one: "If Sophie comes third, then Lisa will not win." The fourth one: "Sophie or Rachida will come second." After the run all predictions prove to be true. In which order did the girls finish?

A. Lisa, Sophie, Rachida                      B. Lisa, Rachida, Sophie                      C. Rachida, Sophie, Lisa  
 D. Sophie, Lisa, Rachida                      E. Sophie, Rachida, Lisa

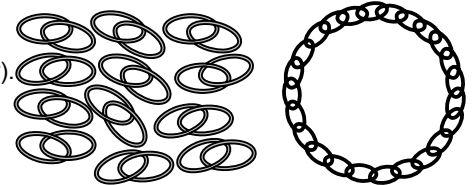
15. The number  $2^{59} \cdot 3^4 \cdot 5^{53}$  ends in a number of zeros. What is the last digit preceding these zeros?

A. 1                      B. 2                      C. 4                      D. 6                      E. 9

16. We have a list of consecutive natural numbers. The list starts with 1. So 1, 2, 3, etcetera. In total the list has 231 digits. What is the last number on the list?

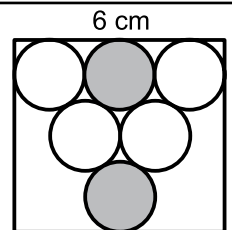
A. 111                      B. 113                      C. 115                      D. 116                      E. 117

17. A jeweller has 12 pieces of necklace of two links. He wants to make one big necklace out of them. Therefore he has to open some of the links (and close them again later). What is the least possible number of links he has to open?



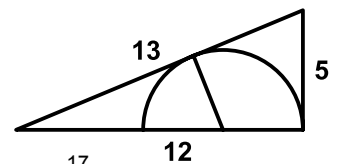
A. 8                      B. 9                      C. 10                      D. 11                      E. 12

18. In a rectangle an "equilateral triangle" of tangent circles is drawn. The long side of the rectangle is 6 cm. How many cm is the distance between the grey circles?



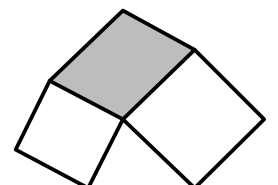
A. 1                      B.  $\sqrt{2}$                       C.  $2\sqrt{3} - 2$                       D.  $\pi/2$                       E. 2

19. Alongside you see two right-angled triangles and a semicircle. The larger right-angled triangle has sides of 5, 12 and 13. What is the radius of this circle?



A.  $\frac{7}{3}$                       B.  $\frac{10}{3}$                       C. 4                      D.  $\frac{13}{3}$                       E.  $\frac{17}{3}$

20. The figure alongside consists of a square of side 4 cm, a square of side 5 cm, a triangle of area  $8 \text{ cm}^2$  and a grey parallelogram. How many  $\text{cm}^2$  is the area of the grey parallelogram?



A. 15                      B. 16                      C. 18                      D. 20                      E. 21

