wizBRAIN 2008

EUROPESE
KANGOEROE
REKEN- EN
WISKUNDEWEDSTRIJD

© Stichting Wiskunde Kangoeroe

www.math.ru.nl/kangoeroe

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 at the end of May

15th April the answers will be on the website

wizBRAIN
the Netherlands: 1 & 2 havo/vwo and 3 & 4 vmbo (excl. basisberoepsgerichte leerweg)
Flanders: bso 2nd & 3rd degree and aso/tso 1st degree

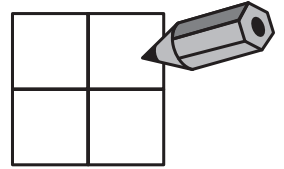**1.** One number will be written in every box.
The numbers are 2, 3, 4 and a secret number.
If you add the numbers in the top row, you will get 9.
If you add the numbers in the bottom, you will get 6.
What is the secret number?

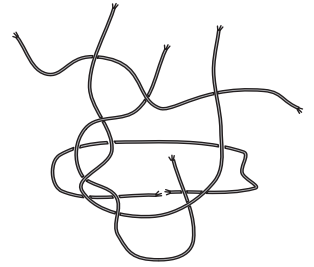A. 4   B. 5   C. 6   D. 7   E. 8

2. Sophie has sent her mother a text message: " It is 370 C in the shade here."
Her mother sends back a text message: " If you send me 100, we will have the same temperature."
How warm is it at her mother's place?

A. 10° C   B. 17° C   C. 22° C   D. 27° C   E. 32° C

3. There are 9 boys and 13 girls in a class. Half of the children have a cold.
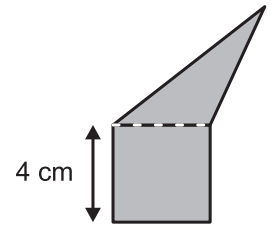At least how many girls have a cold?

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

4. How many pieces of rope are there in the picture alongside?

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

5. A square and a triangle together form a pentagon.
The square and the triangle have the same perimeter.
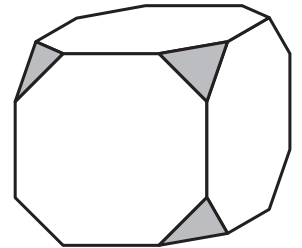What is the perimeter of the pentagon in cm?

4 cm

A. 12   B. 24   C. 28   D. 32
E. depends on the shape of the triangle

6. Alex has 24 white roses, 42 red roses and 36 yellow roses. He wants to divide these in a number of equal bunches.
How many bunches can he make at most?

A. 4   B. 6   C. 8   D. 10   E. 12

7. The corners of a cube are being cut off.
How many edges does the remaining shape have?

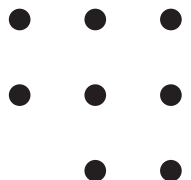A. 26   B. 30   C. 36   D. 40   E. another number

8. 6 kangaroos eat 6 bags of grass in 6 minutes.
How many kangaroos eat 100 bags in 100 minutes?

A. 6   B. 10   C. 60   D. 100   E. 600

9. Bernie has got 9 coins of two eurocents. His brother Charles has got 8 coins of 5 eurocents. Bernie gives some coins to Charles and Charles gives some coins to Bernie as well. They have got the same amount of money now.
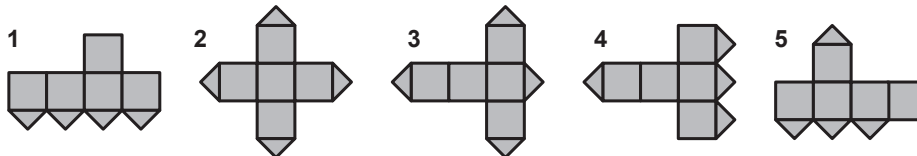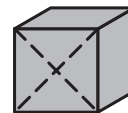At least how many coins did change owner?

A. 4   B. 5   C. 8   D. 12   E. that will never happen

10. You may draw squares that have four of the eight dots for vertices.
How many squares can you draw?

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

11. One of the faces of a cube is cut along the dotted diagonals.
Which of the following nets cannot be a net of that cube?

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

12. Four points *A*, *B*, *C* and *D* are on a line in some order. *AB* = 13, *CD* = 14 and *DA* =12.
How far apart are the two farthest points?

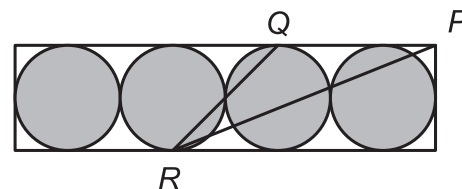**A**. 14   **B**. 24   **C**. 25   **D**. 38   **E**.50

13. Anna, her father and her mother all have their birthday in January. In March 2007 Anna's age was $\frac{1}{6}$ of her mother's age. In March 2008 her age was $\frac{1}{6}$ of her father's age.
How many years older is her father than her mother?

A. 1   **B**. 4   **C**. 5   **D**. 6   **E**. 7

14. A box contains seven cards. The cards are numbered 1 through 7. Gerard takes three cards at random.
Then Hafida takes two cards. There are two cards left in the box now.
Gerard can tell from the numbers on his cards that the sum of the two numbers on Hafida's cards has to be even.
What is the sum of the numbers on Gerard's cards?

A. 6   **B**. 9   **C**. 10   **D**. 12   **E**. 15

15. Four equally big circles touch each other and the rectangle.
P is a vertex of the rectangle. In point *R* and point *Q* the circles touch the rectangle. The circles have a radius of 6 cm.
What is the area of triangle *PQR* in cm²?

A. 27   **B**. 45   **C**. 54   **D**. 108   **E**. 180

16. Elsie and Fiona both cut a rectangular sheet of paper in two. Elsie obtains two rectangles with 40 cm perimeter each.
Fiona also obtains two rectangles, but hers have a perimeter of 50 cm each.
Yet, both have cut identical sheets of paper.
What was the perimeter of the sheet of paper they started with?

A. 40 cm   **B**. 50 cm   **C**. 60 cm   **D**. 80 cm   **E**. 90 cm

17. Someone once asked English mathematician Augustus de Morgan how old he was. His answer back then was:
" if you square my age now, you will get the year we live in now". Augustus de Morgan died in 1871.
In which year was he born?

A. 1806   **B**. 1824   **C**. 1848   **D**. 1849   **E**. 1899

18. In a town two buses are in use at line 5. At intervals of 25 minutes there will be a bus.
In order to shorten this time by 60%, more buses will be used.
The buses will drive at equal intervals.
How many buses will be used at line 5?

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

19. Desiree wants to visit four islands by ferry.
She starts on the mainland.
The ferries only sail to and fro between the mainland and island *A*, the mainland and island *B*,
the mainland and island *C*, islands *A* and *B*, islands *A* and *C* and islands *A* and *D*.
At least how many boat trips does Desiree have to make in order to visit every island and return to the mainland?

A. 4   **B**. 5   **C**. 6   **D**. 7   **E**. 8

20. The boy next door always speaks the truth on Thursday and Friday.
He always lies on Tuesday and on the other days he sometimes speaks the truth and he sometimes lies.
On seven consecutive days he was asked for his name.
The first six days he answered: Jan, Bob, Piet, Bob, Kees, Bob.
What was his answer on the seventh day?

A. Bob   **B**. Jan   **C**. Kees   **D**. Piet   **E**. another name

21. In the equation KAN – GOE = ROE each letter represents a digit.
Equal letters represent equal digits, different letters represent different digits.
What is the largest number KAN can represent?

```
K A N
G O E  _
-----
R O E
```

A. 768　　　**B**. 864　　　**C**. 964　　　**D**. 986　　　**E**. 987

22. Kees writes down all five-digit numbers of which the product of the digits is equal to 25.
Lisa writes down all five-digit numbers of which the product of the digits is equal to 15.
Which of the following statements is true?

A. Kees writes down 5/3 times as many numbers as Lisa
B. Kees writes down twice as many numbers as Lisa
C. Kees and Lisa write down equally many numbers
D. Lisa writes down 5/3 times as many numbers as Kees
E. Lisa writes down twice as many numbers as Kees

23. 11 times 11 times 11 little cubes of 1 cm are being glued together into one big cube.
What is the largest number of little cubes that can be seen at the same time?

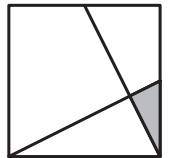**A**. 328　　　**B**. 329　　　**C**. 330　　　**D**. 331　　　**E**. 332

24. Five points *A*, *B*, *C*, *D* and *E* are on a line in this order. We don't know anything about there distances.
Another point is being placed on this line so that the sum of the distances *PA* + *PB* + *PC* + *PD* + *PE* is smallest possible.
Which of the following statements is true?

A. Point *P* can be any point between *A* and *E*.　　**B.** Point *P* is on the same spot as point *B*.
C. Point *P* is the midpoint between the points *B* and *D*.　　**D.** Point *P* can be any point between *B* and *D*.
E. Point *P* is on the same spot as point *C*.

25. Ahmed is going on a hike that – at an average walking pace - takes 2 hours and 55 minutes.
He starts at 8 o'clock and walks at his own pace. At 9 o'clock he takes a little 15 minute break.
From the break it will still be - at the same average walking pace - 1 hour and 15 minutes to the endpoint.
Achmed walks just as fast as before the break and he doesn't pause again.
At what time does he arrive at the endpoint?

A. at 10.00　　　**B**. at 10.30　　　**C**. at 10.55　　　**D**. at 11.10　　　**E**. at 11.20

26. The two line segments shown in the square alongside both connect a vertex
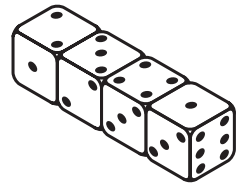to the midpoint of a side.
Which part of the square is coloured grey?

A. $\frac{1}{40}$　　　**B**. $\frac{1}{36}$　　　**C**. $\frac{1}{32}$　　　**D**. $\frac{1}{25}$　　　**E**. $\frac{1}{20}$

27. The percentage of girls in a group of school kids is more than 45%, but less than 50%.
At least how many girls are there in this group?

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

28. A special dice does have 1, 2, 3, 4, 5 and 6 dots, but the number of dots on opposite
faces doesn't have to add up to 7.
Four of these special dice are put in a row, as shown alongside.
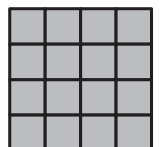What is the total number of dots on the six faces that are touching each other?

A. 19　　　**B**. 20　　　**C**. 21　　　**D**. 22　　　**E**. 23

29. A number of lines, all going through one point, are drawn on paper.
When Alex measures the angles between each pair of lines, the angles 10°, 20°,
30°, 40°, 50°, 60°, 70°, 80° and 90° all appear among the results.
At least how many lines have been drawn?

A .5　　　**B**. 6　　　**C**. 7　　　**D**. 8　　　**E**. 9

30. A square is divided into 16 small squares. In these small squares we will draw diagonals.
The diagonals are not allowed to have common points (not even end points).
How many diagonals can we draw at most?

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

Tick the answer you think will be answered *best* and tick the one you think will be answered *worst*.