## WereldWijde WiskundeWedstrijd W4Kangoeroe Thursday March $19^{\text {th }} 2020$



## WWW.W4KANGOEROE.NL

## Good luck and most of all have fun.

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calculators are not allowed

only a pencil, an eraser and scribbling paper are allowed

answers will be posted on the website about March $29^{\text {th }}$
you may use 75 minutes

results and prizes will arrive at school at the end of May

solutions will be posted on the website about April $20^{\text {th }}$

Breng leren tot leven

www.e-nemo.nl

## fis Texas

Instruments
www.education.ti.com
www.smart.be

Schoolsupport
www.schoolsupport.nl
grekenwinkel ${ }_{\text {gig }}^{\text {g }}$
verstand van school(materialen)
www.derekenwinkel.nl/

EID Premiums
-n." Relatiegeschenken \& Promotieartikele www.idpremiums.nl
 www.platformwiskunde.nl

www.museumboerhaave.nl

1. Which outcome has the smallest value?
A. $1+23456$
B. $12+3456$
C. $123+456$
D. $1234+56$
E. $12345+6$
2. Miguel solves six math problems every day and Lazaro solves four math problems every day.

How many days does it take Lazaro to solve the same number of problems as Miguel solves in four days?
A. 4
B. 5
C. 6
D. 7
E. 8
3. In which of the figures below is the marked angle the largest?
A.

B.

C.

D.

E.

4. A large square is divided into smaller squares.

In one of the smaller squares a diagonal is also drawn.

What fraction of the large square is white?

A. $\frac{1}{3}$
B. $\frac{3}{8}$
C. $\frac{4}{9}$
D. $\frac{1}{2}$
E. $\frac{4}{5}$
5. Which of these fractions has the largest value?
A. $\frac{8+5}{3}$
B. $\frac{8}{3+5}$
C. $\frac{3+5}{8}$
D. $\frac{8+3}{5}$
E. $\frac{3}{8+5}$
6. There are four teams in a soccer tournament. Each team plays every other team exactly once.

In each match, the winner scores 3 points and the loser scores 0 points.
In the case of a draw, both teams score 1 point.
After all matches have been played, which of the following total number of points is impossible for any team to have scored?
A. 4
B. 5
C. 6
D. 7
E. 8
7. The diagram shows a shape made up of 36 identical triangles.

What is the smallest number of such triangles that could be added to the shape to turn it into a regular hexagon?

A. 10
B. 12
C. 15
D. 18
E. 24
8. From the list $-5,-3,-1,2,4$ and 6 Skippy chooses three different numbers such that the outcome of the multiplication of these three numbers is as small as possible.

What is this smallest possible outcome?
A. -200
B. -120
C. -90
D. -48
E. -15
9. Alongside you see a $3 \times 3$ square.

A number is written in each of the nine cells.
The numbers are not visible because they are covered in ink.
However, the sum of the numbers in each row and the sum of the numbers in two of the columns are all known, as shown by the arrows on the diagram.

What is the sum of the numbers in the third column?

A. 41
B. 43
C. 44
D. 45
E. 47
10. If John goes to school by bus and walks back, he travels for 3 hours. If he goes by bus both ways, he travels for 1 hour.

How long does it take him if John walks both ways?
A. 3,5 hours
B. 4 hours
C. 4,5 hours
D. 5 hours
E. 5,5 hours
11. The shortest path from Atown to Cetown runs through Betown.

The two signposts shown are set up along this path.


What distance was written on the broken sign?
A. 1 km
B. 3 km
C. 4 km
D. 5 km
E. 9 km
12. Anna has a goal: she wants to walk 5 km on average each day in March.

At bedtime on $16^{\text {th }}$ March, she realises that she had walked 95 km so far.
How many km does Anna need to walk on average for the remaining days of the month to achieve her target?
A. 3,1
B. 3,6
C. 4
D. 5
E. 5,4
13. Which of the following figures shows what you would see when the pyramid in the diagram is viewed from above?

A.

B.

C.

D.

E.

14. Every pupil in a class either swims or dances or does both.

Three fifths of the class swim and three fifths dance.
Five pupils both swim and dance.
How many pupils are in the class?
A. 15
B. 20
C. 25
D. 30
E. 35
15. Sacha's garden has a special shape shown in the diagram. All the sides are either parallel or perpendicular to each other. Some of the dimensions are shown.

What is the perimeter of Sacha's garden?

A. 22
B. 23
C. 24
D. 25
E. 26
16. In the final of a dance competition there are five dancers.

Each of the three members of the jury gives each dancer a score of $0,1,2,3$ or 4 points.
No two dancers get the same mark from any individual judge. Adam knows all sums of the scores and a few single scores, as shown.

How many points did Adam get from judge III?

|  | Adam | Berta | Clara | David | Emil |
| :---: | :---: | :---: | :---: | :---: | :---: |
| I | 2 | 0 |  |  |  |
| II |  | 2 | 0 |  |  |
| III |  |  |  |  |  |
| total | 7 | 5 | 3 | 4 | 11 |

A. 0
B. 1
C. 2
D. 3
E. 4
17. A large square consists of four identical rectangles and a small square. The area of the large square is $49 \mathrm{~cm}^{2}$ and the length of the diagonal $A B$ of one of the rectangles is 5 cm .

What is the area of the small square?

A. $1 \mathrm{~cm}^{2}$
B. $4 \mathrm{~cm}^{2}$
C. $9 \mathrm{~cm}^{2}$
D. $16 \mathrm{~cm}^{2}$
E. $25 \mathrm{~cm}^{2}$
18. Irene made a 'city' with identical wooden cubes.

Diagram 1 shows the view from above the city.
Diagram 2 shows the view from one of the sides;
however, it is not known from which side this view was taken.

diagram 1


What is the largest number of wooden cubes that Irene could have used for her city?
A. 21
B. 22
C. 23
D. 24
E. 25
19. Twelve coloured marbles are arranged in a row.

There are 3 blue marbles, 2 yellow marbles, 3 red marbles and 4 green marbles but not in that order.
There is a yellow marble at one end and a red marble at the other end.
The red marbles are all touching. The green marbles are also all touching.
The tenth marble from the left is blue.
What colour is the marble sixth from the left?
A. green
B. yellow
C. blue
D. red
E. can be both red and blue
20. Werner's salary is $20 \%$ of his boss's salary.

By what percentage is his boss's salary larger than Werner's salary?
A. $80 \%$
B. $120 \%$
C. $180 \%$
D. $400 \%$
E. $520 \%$
21. Aisha has a strip of paper with the numbers $1,2,3,4$ and 5 written in five cells as shown (see diagram).


She folds the piece of paper a few times, so that the cells are on top of each other.
The folded piece of paper now has 5 layers.
Which of the following configurations from top layer to bottom layer, is not possible to obtain?
A. $3,5,4,2,1$
B. 3, 4, 5, 1, 2
C. $3,2,1,4,5$
D. 3, 1, 2, 4, 5
E. 3, 4, 2, 1, 5
22. Andrew buys 27 identical small cubes.

Each cube has two adjacent faces painted red, the other faces are white.
He uses all of these small cubes to build a large cube.
What is the largest number of completely red faces the large cube can have?
A. 2
B. 3
C. 4
D. 5
E. 6
23. Zaida took a square piece of paper and folded two of its sides to the diagonal (see diagram 1), to obtain a quadrilateral (see diagram 2).

diagram 2

What is the size of the largest angle shown in diagram 2 ?
diagram 1

A. $112,5^{\circ}$
B. $120^{\circ}$
C. $125^{\circ}$
D. $135^{\circ}$
E. $150^{\circ}$
24. We'll look at 4-digit numbers A with the following properties:

- its half is divisible by 2
- its third is divisible by 3
- its fifth is divisible by 5

How many of these 4 -digit numbers $A$ are there?
A. 1
B. 7
C. 9
D. 10
E. 11
25. Saniya writes a positive integer on each edge of a square.

She also writes at each vertex the product of the numbers on the two edges that meet at that vertex. The sum of the numbers at the vertices is 15 .

What is the sum of the numbers on the four edges of the square?
A. 6
B. 7
C. 8
D. 10
E. 15
26. Four children are in the four corners of a $10 \mathrm{~m} \times 25 \mathrm{~m}$ pool.

Their trainer is standing somewhere on one side of the pool.
When he calls them, three children get out and walk the shortest possible distance around the pool to meet him. The three children walk 50 m in total.

What is the shortest distance the trainer needs to walk to get to the fourth child?
A. 10 m
B. 12 m
C. 15 m
D. 20 m
E. 25 m
27. Sophia has an unlimited amount of identical isosceles right-angled triangles.

Each time she uses at most 52 of these triangles to make a square.
How many different sized squares can she make?
A. 6
B. 7
C. 8
D. 9
E. 10
28. The statements below give clues to the identity of a 4-digit number.


What is the last digit of the 4 -digit number that we are looking for?
A. 0
B. 1
C. 3
D. 5
E. 9
29. Cleo is building a pyramid with metal spheres.

The square base consists of $4 \times 4$ spheres as shown in the figure.
The layers consist of $3 \times 3$ spheres, $2 \times 2$ spheres and a final sphere at the top.
At each point of contact between two spheres, a blob of glue is placed.
How many blobs of glue will Cleo place?

A. 72
B. 80
C. 88
D. 92
E. 96
30. Anne, Boris and Carl ran a race.

They started at the same time, and their speeds were constant.
When Anne finished, Boris had 15 m to run and Carl had 35 m to run.
When Boris finished, Carl had 22 m to run.
What was the length of the race course?
A. 135 m
B. 140 m
C. 150 m
D. 165 m
E. 175 m

