

WereldWijde WiskundeWedstrijd
W4Kangoeroe

THURSDAY
MARCH 18TH 2021

WWW.W4KANGOEROE.NL

**Good luck and most of
all have fun.**

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calculators are not allowed



you may use 75 minutes



only a pencil, an eraser and scribbling paper are allowed



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



answers will be posted on the website about March 29th



solutions will be posted on the website about April 20th

wizBRAIN
havo 1, 2 & 3
vwo 1 & 2
vmbo 3 & 4 m.u.v. basisberoepsgerichte leerweg.



Breng leren tot leven
www.zwijzen.nl



www.e-nemo.nl



www.education.ti.com



www.smart.be



www.schoolsupport.nl



www.idpremiums.nl



www.mathplay.eu



www.ru.nl



www.platformwiskunde.nl



www.museumboerhaave.nl

1. *Sanne* looks at her weather app and sees that it will get colder each day for the next five days.

What can *Sanne* see on her weather app?

A.

2 °C	4 °C	1 °C	-3 °C	-1 °C
Fri	Sat	Sun	Mon	Tue

B.

-2 °C	5 °C	3 °C	0 °C	-1 °C
Fri	Sat	Sun	Mon	Tue

C.

6 °C	-4 °C	3 °C	2 °C	-1 °C
Fri	Sat	Sun	Mon	Tue

D.

4 °C	1 °C	0 °C	-3 °C	-6 °C
Fri	Sat	Sun	Mon	Tue

E.

2 °C	0 °C	-4 °C	-2 °C	-1 °C
Fri	Sat	Sun	Mon	Tue

2. Which of the following symbols has an axis of symmetry?



3. What percentage of the figure is coloured grey?

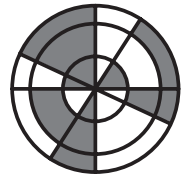
A. 30%

B. 35%

C. 40%

D. 45%

E. 50%



4. The five vases shown have the same height and each has a volume of 1 litre. Half a litre of water is poured into each vase.
- In which vase would the level of water be the highest?



5. When the five puzzle pieces shown are fitted together correctly, you will see a rectangle with a calculation written on it.

What is the answer to this calculation?



A. -100

B. -8

C. -1

D. 199

E. 208

6. The number 4567 is a four-digit number with the property that their digits, from left to right, are consecutive and in ascending order.

How many four-digit numbers have this property, including the number 4567 itself?

A. 5

B. 6

C. 7

D. 8

E. 9

7. What is the value of $\frac{20 \times 21}{2 + 0 + 2 + 1}$

A. 42

B. 64

C. 80

D. 84

E. 105

8. A 3 by 3 by 3 cube is made of white, grey and black 1 by 1 by 1 cubes, as shown in diagram 1. The white part and the black part of the cube are shown in diagram 2.

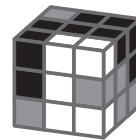


diagram 1

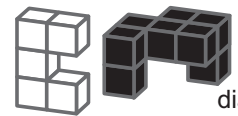
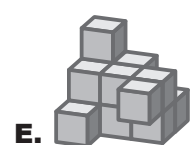
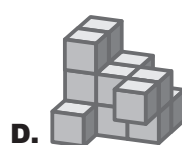
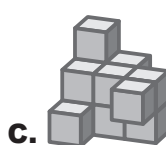
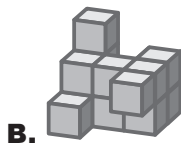
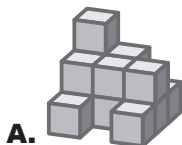


diagram 2

Which of the following parts shows the grey part of the cube?



9. *Sandra* has added the two two-digit numbers on the left side of the board correctly and got the answer 137.

AB	ADCB
CD +	CBAD +
137	?

What answer does *Sandra* get if she adds the two four-digit numbers on the right side of the board?

A. 13737

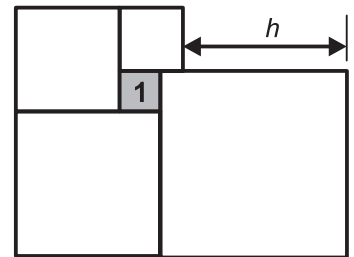
B. 13837

C. 14747

D. 23737

E. 137137

18. Five squares are positioned as shown in the diagram. The smallest square has area 1.



What is the value of h ?

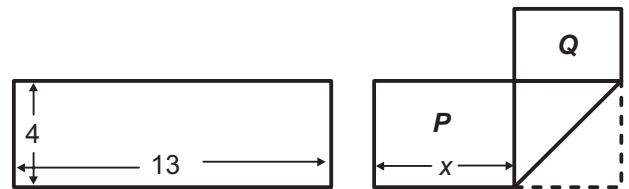
- A. 3 B. 3.5 C. 4 D. 4.2 E. 4.5

19. There are 20 questions in a quiz. Each correct answer scores 7 points, each wrong answer scores minus 4 points and each question left blank scores 0 points. Eric took part in this quiz and scored 100 points.

How many questions did Eric leave blank?

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

20. A rectangular strip of paper of dimensions 4 by 13 (diagram 1) is folded as shown in diagram 2. Two rectangles are formed with areas P and Q , where the area of P is twice the area of Q .



What is the value of x ?

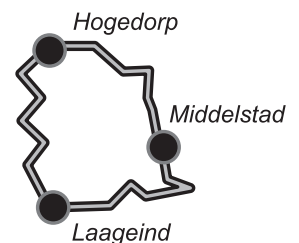
- A. 5 B. 5.5 C. 6 D. 6.5 E. $4\sqrt{2}$

21. A box of fruit contains twice as many apples as pears. Alana and Imre divided them up so that Alana got twice as many pieces of fruit as Imre.

Which one of the following statements is always true?

- A. Alana got at least one pear B. Alana got twice as many apples as pears.
 C. Alana got twice as many apples as Imre. D. Alana got as many apples as Imre got pears.
 E. Alana got as many pears as Imre got apples.

22. Three places are connected by roads as shown. From Laageind to Hogedorp the detour via Middelstad is 1 km longer than the direct road. From Laageind to Middelstad the detour via Hogedorp is 5 km longer than the direct road. From Hogedorp to Middelstad the detour via Laageind is 7 km longer than the direct road.



How long is the shortest of the three direct roads between the places?

- A. 1 km B. 2 km C. 3 km D. 4 km E. 5 km

23. In a particular fraction, the numerator and denominator are both positive. The numerator of this fraction is increased by 40%.

By what percentage should its denominator be decreased so that the new fraction is double the original fraction?

- A. 10% B. 20% C. 30% D. 40% E. 50%

24. The six-digit number 1ABCDE is multiplied by 3 and the result is ABCDE1, also a six-digit number.

What is the sum of the six digits of this number?

- A. 24 B. 27 C. 30 D. 33 E. 36

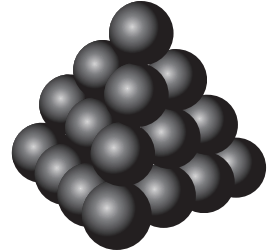
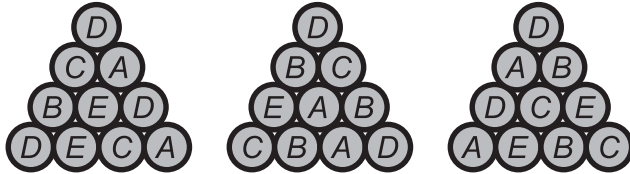
25. A soccer ball is made of white hexagons and black pentagons, as seen in the picture. There are a total of 12 pentagons.



How many hexagons are there?

- A. 12 B. 15 C. 18 D. 20 E. 24

26. A triangular pyramid is built with 20 balls, as shown. Each ball is labelled with one of the letters *A*, *B*, *C*, *D* or *E*. There are four balls with each type of label. The picture shows the labels of the balls on three of the faces of the pyramid.



What is the label on the hidden ball in the center of the pyramid's base?

- A. A B. B C. C D. D E. E

27. In a tournament, each of the six teams plays one match against every other team. In each round of matches, three take place simultaneously. A TV station has already decided which match it will broadcast in each round, as shown in the diagram below.

Round 1	Round 2	Round 3	Round 4	Round 5
A - B	C - D	A - E	E - F	A - C

In which round will team *D* play against team *F*?

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

28. 2021 coloured kangaroos are arranged in a row and are numbered from 1 to 2021. Each kangaroo is coloured either red, grey or blue. Amongst any three consecutive kangaroos, there are always kangaroos of all three colours. *Lucas* guesses the colours of five kangaroos. These are his guesses: Kangaroo 2 is grey; kangaroo 20 is blue; kangaroo 202 is red; kangaroo 1002 is blue; kangaroo 2021 is grey. Only one of his guesses is wrong.

What is the number of the kangaroo whose colour *Lucas* guessed incorrectly?

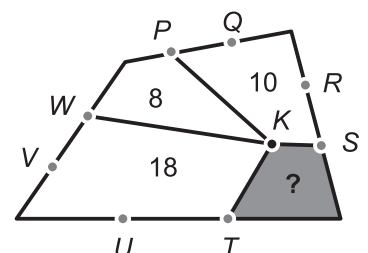
- A. 2 B. 20 C. 202 D. 1002 E. 2021

29. In a town there are 21 knights who always tell the truth and 2000 villains who always lie. The stadtholder divided 2020 of these 2021 people into 1010 pairs. Every person in a pair described the other person as either a knight or a villain. As a result, 2000 people were called knights and 20 people were called villains.

How many pairs of two villains were there?

- A. 980 B. 985 C. 990 D. 995 E. 1000

30. The diagram shows a large quadrilateral divided into four smaller quadrilaterals with a common vertex *K*. The other labelled points divide the sides of the large quadrilateral into three equal parts. The number indicate the areas of the corresponding small quadrilateral.



What is the area of the grey quadrilateral?

- A. 4 B. 5 C. 6 D. 6.5 E. 7