wizBRAIN 2022

Good luck and most of all have fun.!

- 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.

1. The number plate of *Claudia*'s car fell off.
She put it back upside down but luckily this didn't make any difference.

Which one of the following could be *Claudia*'s number plate?

A. 04 NSN 40 **B.** 60 SOS 09 **C.** 80 BNB 08 **D.** 06 HNH 60 **E.** 08 NBN 80

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2. *Awan* arranges the five numbered pieces below so that he gets the smallest possible nine-digit number.

Which piece does he place at the right-hand end?

A. 4 **B.** 8 **C.** 31 **D.** 59 **E.** 107

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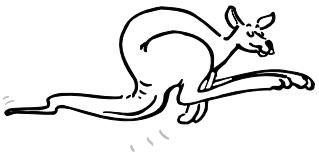
3. *Kengu* enjoys to jump on the number line.
He always makes two large jumps followed by three small jumps, as shown.
He repeats this routine over and over. Kengu starts at the number 0.



On which of the numbers below will *Kengu* definitely land?

A. 82 **B.** 83 **C.** 84 **D.** 85 **E.** 86

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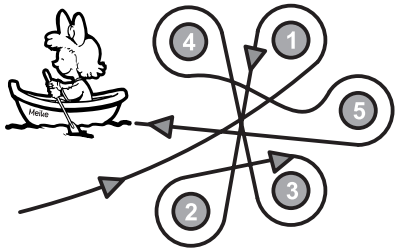
4. *Meike* paddled around five buoys according to the route indicated by the arrows in the picture.



Around which of the buoys did *Meike* paddle in a clockwise direction?

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

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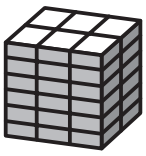
5. *Bob the Builder* has a brick whose shortest side is 4 cm.
He uses several such bricks to build the cube shown.



What are the dimensions, in cm, of his brick?

A. 4 × 6 × 12 **B.** 4 × 6 × 16 **C.** 4 × 8 × 12 **D.** 4 × 8 × 16 **E.** 4 × 12 × 16

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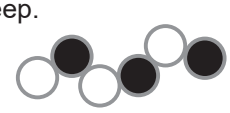
6. The black and white caterpillar shown in the picture curls up to sleep.



Which of the following can be seen?

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

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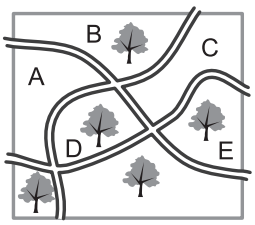
7. There are five empty spaces in the problem below.
Sanja wants to fill four spaces with plus signs and one with a minus sign, so that the problem is correct.

$$6 \square 9 \square 12 \square 15 \square 18 \square 21 = 45$$

Where should she place the minus sign?

A. between 6 and 9 **B.** between 9 and 12 **C.** between 12 and 15
D. between 15 and 18 **E.** between 18 and 21

8. There are five large trees and three paths in the park.
A new tree is planted so that there are the same number of trees on both sides of each path.



In which section of the park is the new tree planted?

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

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9. How many integers between 100 and 300 can you make with the digits 1, 3, 5, 7 and 9?

A. 25 **B.** 50 **C.** 75 **D.** 100 **E.** 150

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10. *Gerard* wrote down the addition of the squares of two numbers.
Unfortunately, some numbers are not visible because they are covered in ink, as seen below.

What is the last digit of the first number?

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

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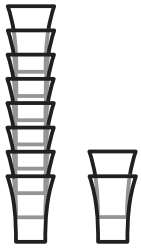
11. In *Monica*'s kitchen, the distance between the shelves in the cupboard is 36 cm.
A stack of eight glasses is 42 cm high and a stack of two glasses is 18 cm high.



What is the largest number of glasses that can be stacked in one stack in *Monica*'s cupboard?

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

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12. On a standard die, the addition of the numbers of dots on opposite faces is always 7.
Four standard dice are glued together, as shown in the picture.

What is the smallest total number of dots that could be seen on the entire surface?

A. 52 **B.** 54 **C.** 56 **D.** 58 **E.** 60

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13. The ages of three sisters are different. They are on average 10 years old.
If they come together in pairs, then the average ages of two of those pairs is 11 and 12.

What is the age of the eldest sister?

A. 10 **B.** 11 **C.** 12 **D.** 14 **E.** 16

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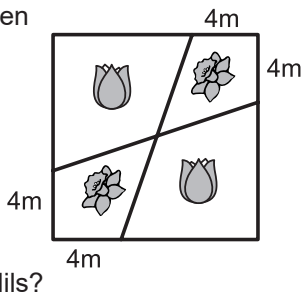
14. *Tony,* the gardener, has planted tulips and daffodils in a square garden with sides of 12 m, as shown in the picture.



What is the total area of the areas of the garden where he has planted daffodils?

A. 24 m² **B.** 32 m² **C.** 36 m² **D.** 44 m² **E.** 48 m²

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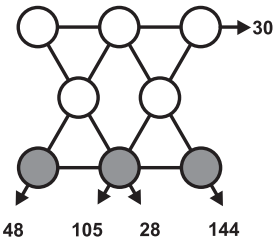
15. *Werner* wrote several numbers on a piece of paper whose addition is 22.
Ria then subtracted each of *Werners*'s numbers from 7 and wrote down her answers.
The sum of *Ria*'s numbers is 34.

How many numbers had *Werner* written down?

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

16. The numbers 1 to 8 are placed in the circles shown.
Each number can be used only once.
The numbers next to the arrows show the products of the three numbers
In the circles on that straight line.



What is the sum of the numbers in the three grey circles at the bottom of the figure?

A. 11 **B.** 12 **C.** 15 **D.** 17 **E.** 19

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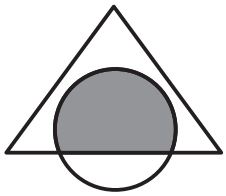
17. The area of the grey intersection of a circle and a triangle is 45% of the area of the complete figure, as shown.
The area of the triangle outside the circle is 40% of that total area.



What percentage of the circle lies outside the triangle?

A. 20% **B.** 25% **C.** 30% **D.** 35% **E.** 50%

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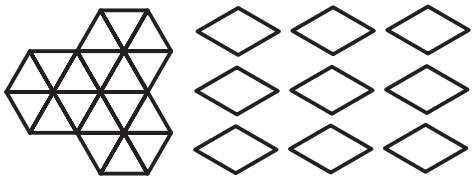
18. In how many ways can the shape on the left be completely covered using nine tiles like the ones on the right?



A. 1 **B.** 6 **C.** 8 **D.** 9 **E.** 12

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19. In my office, there are two clocks. One clock gains 1 minute every hour and the other loses 2 minutes every hour. Yesterday I set them both to the correct time but when I looked at them today, I saw that the time shown on one was 11:00 and shown on the other was 12:00.

What time was it when I set the two clocks?

A. 23:00 **B.** 19:40 **C.** 15:40 **D.** 14:00 **E.** 11:20

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20. The villages *A*, *B*, *C* and *D* are situated, not necessarily in that order, on a long straight road.
The distance from *A* to *C* is 75 km, the distance from *B* to *D* is 45 km and the distance from *B* to *C* is 20 km.

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Which of the following could **not** be the distance from *A* to *D*?

A. 10 km **B.** 50 km **C.** 80 km **D.** 100 km **E.** 140 km

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21. *Jenny* decided to enter numbers into the cells of a 3 × 3-table so that the sum of the numbers in all four possible 2 × 2-squares will be the same.
The numbers in three of the corner cells have already been written, as shown.

2		4
X		3

Which number should she write in the fourth corner cell, marked with X?

A. 0 **B.** 1 **C.** 4 **D.** 5 **E.** 6

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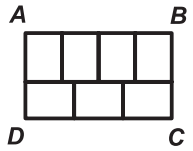
22. *Marc* always cycles at the same speed and he always walks at the same speed.
He can cycle from his house to school in 20 minutes.
If he walks it takes 60 minutes.
Yesterday *Marc* went to school by bike, but he got a flat tire on the way.
That's why he had to walk the rest of his journey.
As a result, his total travel time was 52 minutes.

What fraction of his journey did *Marc* make by bike?

A. $\frac{1}{6}$ **B.** $\frac{1}{5}$ **C.** $\frac{1}{4}$ **D.** $\frac{1}{3}$ **E.** $\frac{1}{2}$

23. The large rectangle *ABCD* is divided into seven identical rectangles.



What is the ratio *AB*:*BC*?

A. 1:21 **B.** 4:3 **C.** 8:5 **D.** 12:7 **E.** 7:3

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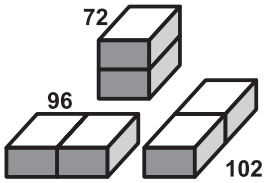
24. A builder has two identical bricks.
She places them side by side in three different ways, as shown.
The surface areas of the three resulting shapes are 72, 96 and 102.



What is the surface area of the original brick?

A. 36 **B.** 48 **C.** 52 **D.** 54 **E.** 60

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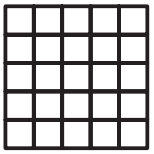
25. What is the smallest number of cells that need to be coloured in a 5 × 5-square so that any 1 × 4 or 4 × 1 rectangle lying inside the square has at least one cell coloured?



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

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26. *Mowgli* asks a zebra and a panther what day it is.
The zebra always lies on Monday, Tuesday and Wednesday.
The panther always lies on Thursday, Friday and Saturday.
The zebra says, ”Yesterday was one of my lying days.”
The panther says ”Yesterday was also one of my lying days.”

What day is it?

A. Thursday **B.** Friday **C.** Saturday **D.** Sunday **E.** Monday

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27. Several points are marked on a line.
Renard then marked another point between each two adjacent points on the line.
He repeated this process a further three times. There are now 225 points marked on the line.

How many points were marked on the line initially?

A. 10 **B.** 12 **C.** 15 **D.** 16 **E.** 25

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28. A painter wanted to mix 2 litres of blue paint with 3 litres of yellow paint to make 5 litres of green paint.
However, by mistake he used 3 litres of blue and 2 litres of yellow, resulting in the wrong shade of green.

Assuming he adds some extra blue and/or yellow to the incorrect green paint, what is the smallest amount of the incorrect green paint that he must throw away so that he could make 5 litres of paint of the correct shade of green?

A. $\frac{5}{9}$ liter **B.** $\frac{3}{5}$ liter **C.** $\frac{2}{3}$ liter **D.** $\frac{3}{2}$ liters **E.** $\frac{5}{3}$ liters

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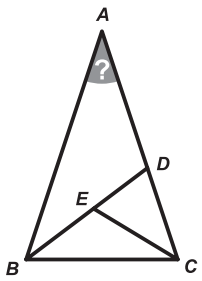
29. An isosceles triangle *ABC*, because *AB* = *AC*.
This triangle is split into three smaller isosceles triangles, as shown in the figure.
So *AD* = *DB*, *CE* = *CD* and *BE* = *CE*.



What is the size, in degrees, of angle *A*?

A. 24 **B.** 28 **C.** 30 **D.** 35 **E.** 36

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30. There are 2022 kangaroos and some koalas living across seven parks.
In each park the number of kangaroos is equal to the total number of koalas in all the other parks.

How many koalas live in the seven parks in total?

A. 288 **B.** 337 **C.** 576 **D.** 674 **E.** 2022