wizBRAIN 2010

W4 KANGOEROE
WereldWijde WiskundeWedstrijd

Good luck and most of all have fun.

www.w4kangoeroe.nl

calculator not allowed

you may use 75 minutes

scrap paper is allowed

results and awards at school mid-May

23th March the answers will be on the website

20th April the explanations will be on the website

wizBRAIN
havo 1, 2 & 3
vwo 1 & 2
vmbo 3 & 4 (excl. basisberoepsgerichte leerweg)

wiZBRAIN 2010

1. 89 – 78 + 67 – 56 + 45 – 34 + 23 – 12 = ?

A. 33 **B.** 44 **C.** 55 **D.** 56 **E.** 404

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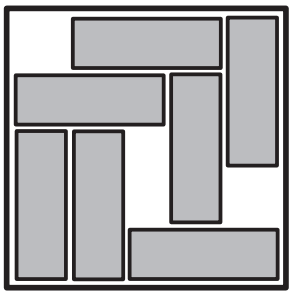
2. There are seven blocks in a box.
By sliding the blocks you can make room for another block.
How many blocks in the box do you have to slide at least?



A. 2 **B.** 3 **C.** 4 **D.** 5
E. it is impossible

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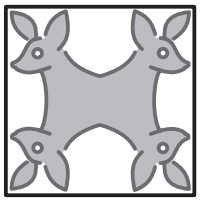
3. How many axes of symmetry does this shape have?



A. 0 **B.** 1 **C.** 2 **D.** 4 **E.** infinitely many

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4. Stuffed kangaroos are sold in little cube shaped boxes.
These boxes are transported to the shops in big cube shaped boxes.
Eight little boxes fit exactly in such a big box.
How many little boxes stand on the bottom of such a big box then?

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

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5. In a factory 3500 kg tomatoes are sorted into small and big tomatoes. The ratio in weight of *small tomatoes : big tomatoes equals 2 : 3*. The small tomatoes are used for tomato paste, the big ones for ketchup.
How many kg tomatoes are there for ketchup?

A. 500 **B.** 700 **C.** 1400 **D.** 2100 **E.** 2450

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6. Tony has a number of logs. He will saw these logs into smaller logs.
53 Times he saws through a log. He has got 72 logs then.
How many logs did Tony have when he started?

A. 17 **B.** 18 **C.** 19 **D.** 20 **E.** 21

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7. Lisa writes down seven consecutive whole numbers.
If she adds the smaller three numbers she will get 33 for outcome. She adds the three bigger numbers as well.
What will the outcome be then?

A. 37 **B.** 39 **C.** 42 **D.** 45 **E.** 48

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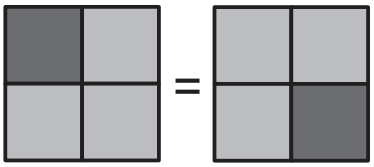
8. A square consists of four smaller squares.
Each small square is being coloured green or blue.
Two ways of colouring are *the same* when by turning one you obtain the other.
How many different ways of colouring are there?



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

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9. Lisa adds the first one hundred even numbers. She adds the first one hundred odd numbers as well.
She subtracts the smaller outcome from the larger one.
Which answer will Lisa get then?

A. 0 **B.** 50 **C.** 100 **D.** 10100 **E.** 15150

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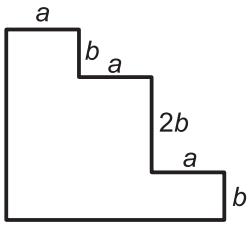
10. The perimeter of this shape is equal to

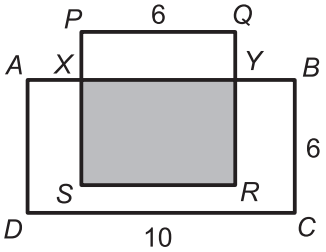


A. 3*a*+4*b* **B.** 3*a*+8*b* **C.** 6*a*+4*b* **D.** 6*a*+6*b* **E.** 6*a*+8*b*

11. Grandma baked a cake. Later some grandchildren will be visiting.
She only knows that there will be 3, 5 or 6 of them. She wants to give each of them an equal number of slices of cake and she wants to cut the cake in the least possible number of equal slices.
In how many slices should she slice the cake?

A. 15 **B.** 24 **C.** 30
D. 60 **E.** 90

12. *ABCD* is a 6 by 10 rectangle, *PQRS* is a 6 by 6 square.
The area of the grey region is half the area of rectangle *ABCD.*
How long is *PX*?



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

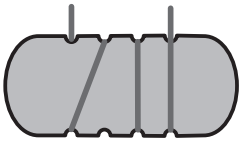
13. Which of the following numbers is the smallest two-digit number that you cannot get by adding three different one-digit numbers?

A. 10 **B.** 15 **C.** 23 **D.** 25 **E.** 28

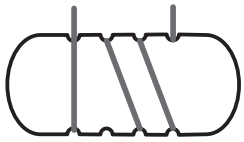
14. Lisa joined three pieces of chain to make one long chain using two extra links. That took her 18 minutes.
Later on she would like to join 6 pieces of chain the same way, using extra links, to make one long chain.
How many minutes will she need for that?

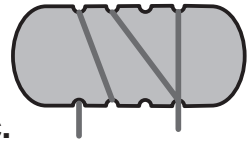
A. 27 **B.** 30 **C.** 36 **D.** 45 **E.** 60

15. Fred wrapped a piece of string around a piece of wood. The picture shows you the front.
What does the back look like?

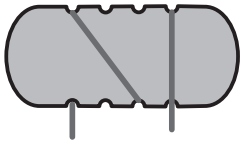
A. 

B. 

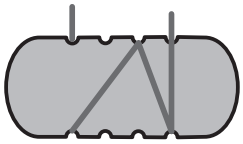




C.

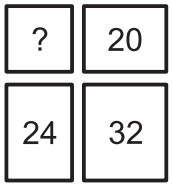


D.



E.

16. A rectangle has been cut into four smaller rectangles.
The perimeter of three of these smaller rectangles is known: 20, 24 and 32.
What is the perimeter of the fourth rectangle?



A. 12 **B.** 13 **C.** 14 **D.** 15 **E.** 16

17. Five numbers *a*, *b*, *c*, *d* and *e* meet the following description: $a-1 = b+2 = c-3 = d+4 = e-5$.
Which of the numbers *a*, *b*, *c*, *d* or *e* is the greatest one?

A. *a* **B.** *b* **C.** *c* **D.** *d* **E.** *e*

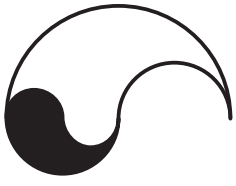
18. There are 50 blocks in a box. They are blue, red or white. The number of white blocks is eleven times the number of blue blocks. The number of red blocks is more than the number of blue ones, but there are fewer red blocks than white ones.
The red blocks are less in number than the white blocks, by how many?

A. 2 **B.** 11 **C.** 19 **D.** 22 **E.** 30

19. You want to divide a sheet of paper into exactly five regions by drawing the least possible number of straight lines.
How many lines do you need?

A. 3 **B.** 4 **C.** 5 **D.** 6 **E.** that's impossible

20. This logo is made entirely out of semi-circles.
The radii of the circles are 2, 4 and 8 cm.
Which part of the logo is black?

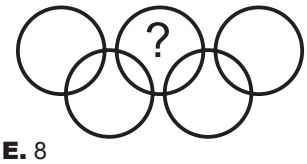


A. $\frac{1}{5}$ **B.** $\frac{1}{4}$ **C.** $\frac{1}{3}$ **D.** $\frac{2}{3}$ **E.** $\frac{3}{4}$

21. On the blackboard are the numbers from 1 to 10. Tony will do the following again and again: add two of the numbers that are on the blackboard and subtract 1 from the outcome; then erase the two chosen numbers and write the outcome of the calculation on the board. Tony continues doing that until there is only one number left on the board. Which number is on the board then?

A. 11 **B.** 45 **C.** 46 **D.** 47 **E.** 55

22. Each of the numbers from 1 up to and including 9 is being written in one of the nine areas within the circles. One number in each area. If you add the numbers within one circle, the outcome will be 11 for each circle.
Which number will be on the place of the question mark?



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

23. A kangaroo has a lot of little 1 by 1 by 1 cm cubes. Each cube has one colour.
The kangaroo wants to make a large 3 by 3 by 3 cm cube out of 27 of these little cubes.
But every two cubes that have a common vertex should be of different colours.
How many differently coloured little cubes does the kangaroo need to have at least?

A. 6 **B.** 8 **C.** 9 **D.** 12 **E.** 27

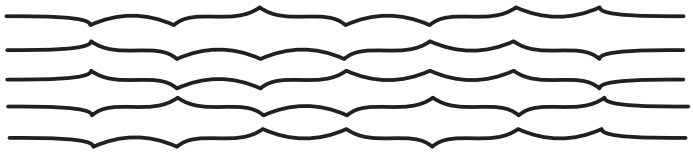
24. On an exchange market goods are being exchanged according to the price list alongside. A farmer goes to the market with a number of chickens.
He wants to go home with a goose, a turkey and a cock.
How many chickens should he take to the market at least?

price list exchange market		
1 turkey	⇔	5 cocks
1 goose + 2 chickens	⇔	3 cocks
4 chickens	⇔	1 goose

A. 14 **B.** 15 **C.** 16 **D.** 17 **E.** 18

25. A strip of paper is folded in two three times. Then it is unfolded again.
When holding the strip upright, you can see the folds from above.
Which of the following strips cannot be seen?

A.
B.
C.
D.
E.



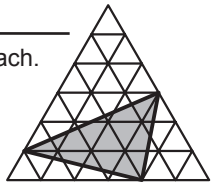
26. On each of 18 cards is the number 4 or 5. All numbers added up gives an outcome that is divisible by 17.
On how many cards is the number 4?

A. 4 **B.** 5 **C.** 6 **D.** 7 **E.** 9

27. In a little village each human being either always speaks the truth or always lies.
Yesterday a number of people were sitting in the waiting room. Three people each spoke two sentences.
The first one said: " There are no more than three people here" and he also said: "We are all liars."
The second one said: "There are no more than four people here" and he also said: " Not all of us are liars."
The third one said: "There are five people here" and he also said: "Three of us are liars.'
How many people were in the waiting room and how many of them were liars?

A. 3 people, 1 liar **B.** 4 people, 1 liar **C.** 4 people, 2 liars
D. 5 people, 2 liars **E.** 5 people, 3 liars

28. The large equilateral triangle consists of 36 little equilateral triangles with an area of 1 cm^2 each.
How many squared cm is the area of the grey triangle?

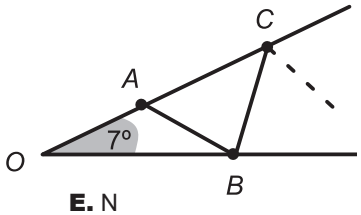


A. 9 **B.** 10 **C.** 11 **D.** 12 **E.** 15

29. The least common multiple of the numbers 9 and 12 is 36: this is the smallest number that is in the table of 9 *and* in the table of 12. Tony and Lisa both have a whole number in mind. The least common multiple of 24 and Tony's number is smaller than the least common multiple of 24 and Lisa's number.
Which number cannot be the outcome if you divide Lisa's number by Tony's number?

A. $\frac{2}{3}$ **B.** $\frac{6}{7}$ **C.** $\frac{7}{8}$ **D.** $\frac{8}{7}$ **E.** $\frac{7}{6}$

30. A kangaroo jumps alternately on the two lines, starting from *O*.
From *O* to *A*, then to *B*, next to *C*, etcetera.
All jumps are equally long. The two lines form an angle of 7 degrees.
He attempts to get as far away from *O* as possible and then stops jumping.
At which letter does the kangaroo stop?



A. J **B.** K **C.** L **D.** M **E.** N