2007

wizBRAIN

calculator not allowed

you may use 75 minutes

of course scrap paper is allowed

results and awards at school at the end of April

20st March the answers will be on the website

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

2007

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1. What is $\frac{2007}{2+0+0+7}$?

A. 75 **B.** 123 **C.** 213 **D.** 223 **E.** 1003

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2. On both sides of a garden path grow rose plants along a distance of 20 metres.
The distance between every two successive plants is 2 metres.
How many plants are there?

A. 10 **B.** 12 **C.** 18 **D.** 20 **E.** 22

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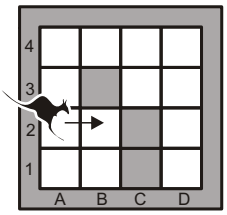
3. A kangaroo jumps from square to square.
It starts at square A2 and goes in the direction of the arrow.
It always jumps forward until it meets a barrier.
Then it turns right. If it can't turn right, it stops.
The grey squares and the border are barriers.
At which square does the kangaroo stop?



A. A1 **B.** B2 **C.** C3 **D.** D1 **E.** the kangaroo never stops.

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4. You may choose three numbers from the table shown.
From each horizontal row you may only take one number.
From each vertical row you may only take one number as well.
You add the three chosen numbers.
What is the largest answer you can get?

1	2	3
4	5	6
7	8	9

A. 12 **B.** 15 **C.** 18 **D.** 21 **E.** 24

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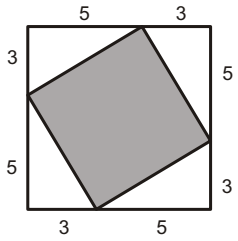
5. In a big square a smaller square has been drawn, see figure.
What is the area of the small square?



A. 16 **B.** 28 **C.** 34 **D.** 36 **E.** 49

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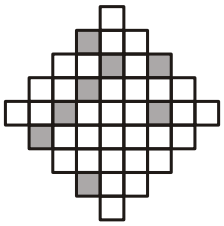
6. The figure shown should get an axis of symmetry.
Therefore you may colour a number of squares grey.
At least how many squares do you have to colour grey?



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

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7. The number 13931 is called a palindrome.
This is a number that is the same whether you read it backwards or forwards.
(A number cannot start with 0.)
What is the difference between the largest *six*-digit palindrome and the smallest *five*-digit palindrome?

A . 989989 **B.** 989998 **C.** 998998 **D.** 999898 **E.** 999988

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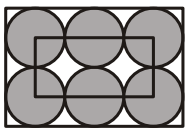
8. The six equally big circles touch each other and the big rectangle.
The small rectangle has the centres of four circles for vertices.
The perimeter of the small rectangle is 60 cm.
How many cm is the perimeter of the big rectangle?



A. 80 **B.** 100 **C.** 120 **D.** 140 **E.** 160

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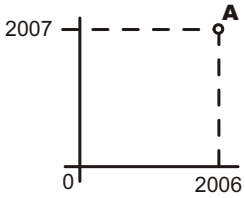
9. On a set of axes the following points have been drawn:
A(2006,2007), B(2007,2006), C(-2006,-2007), D(2006,-2007) en E(2007,-2006).
Which of the following line segments is horizontal?



A. AB **B.** AD **C.** BC **D.** BE **E.** CD

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10. Daan has written down a negative integer.
Sophie adds 1 to it. Sanne multiplies Daan's number by 2. Anna multiplies Daan's number by -2.
Lisa first multiplies Daan's number by 6 and then adds 2 to the answer.
Julia subtracts 2 from Daan's number.
Who of the girls gets the largest answer?

A. Anna **B.** Julia **C.** Lisa **D.** Sanne **E.** Sophie

3 points

2007

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11. Lily plants are growing in a lake. The leaves already cover a great part of the water surface.
Each day the surface area that is covered by the leaves doubles.
After ten days one quarter of the whole lake is covered.
How many days does it take before the whole lake is covered?

A. 2 **B.** 4 **C.** 8 **D.** 10 **E.** 16

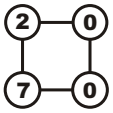
12. On two horizontal lines 6 points are being drawn. 4 on the top line and 2 on the bottom line.
How many triangles can you make when only these points can be vertices?

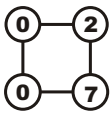
A. 6 **B.** 10 **C.** 12 **D.** 16 **E.** 18

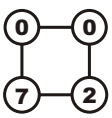
13. Last week $\frac{2}{3}$ of the fruit lovers bought apples. $\frac{1}{3}$ bought pears.
This week $\frac{1}{4}$ of the apple buyers switched to buying pears.
What is true now?

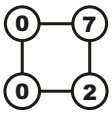
A. $\frac{1}{4}$ of the fruit lovers buy apples, $\frac{3}{4}$ buy pears.
B. $\frac{1}{3}$ of the fruit lovers buy apples, $\frac{2}{3}$ buy pears.
C. $\frac{5}{12}$ of the fruit lovers buy apples, $\frac{7}{12}$ buy pears.
D. $\frac{1}{2}$ of the fruit lovers buy apples, $\frac{1}{2}$ buy pears.
E. $\frac{7}{12}$ of the fruit lovers buy apples, $\frac{5}{12}$ buy pears.

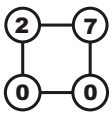
14. In the circles at the vertices of the square are the numbers 2, 7, 0 and 0.
One side is selected and the two numbers on that side are being raised or lowered by the same amount. We repeat this a number of times.
Which of the following figures is *impossible* to obtain this way?



A.


B.


C.


D.


E. we can get all figures this way

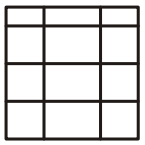
15. The numbers **1** = 1 x 1, **4** = 2 x 2, **9** = 3 x 3, **16** = 4 x 4 and so on are called squares.
What percentage of the numbers 1, 2, 3, 4 and so on up till 10,000 are squares?

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

16. If I give Daan two chocolate bars, I may borrow his bicycle for three hours.
If I give him 12 cookies, I may use his bicycle for two hours.
When I give Daan one bar and 3 cookies tomorrow, for how many hours may I borrow his bicycle then?

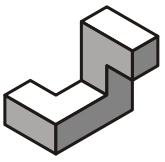
A. ½ **B.** 1 **C.** 2 **D.** 3 **E.** 4

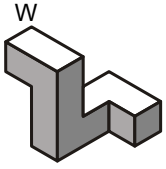
17. By drawing 9 lines (5 horizontal ones and 4 vertical ones) you can make 12 boxes.
If you use 6 horizontal lines and 3 vertical lines, you can only make 10 boxes.
What is the largest number of boxes you can get, if you draw 15 lines at most?

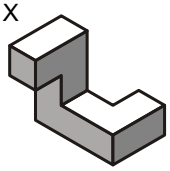


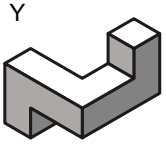
A. 22 **B.** 30 **C.** 36 **D.** 40 **E.** 42

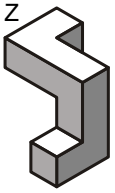
18. The figure shown alongside is being turned.
Which of the following figures can you get then?



W


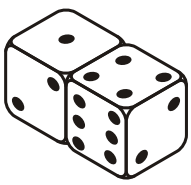
X


Y


Z


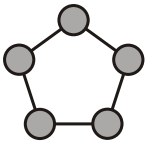
A. W, X and Y **B.** W and Y **C.** X and Z **D.** only Y **E.** none of these

19. You can't see a number of faces of these two ordinary dice.
What is the total number of dots on the faces that you cannot see?



A. 12 **B.** 15 **C.** 20 **D.** 27 **E.** another number

20. In this cycle five whole numbers are written.
If you add two or three numbers that are next to each other, you can never divide the answer by 3.
How many of these five numbers themselves can you divide by 3?



A. 0 **B.** 1 **C.** 2 **D.** 3 **E.** you can't tell

4 points

2007

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21. Sophie's calculator doesn't work properly. You can't see the 1.
If Sophie types the number 3131 for example, she reads the number 33 without spaces.
Daan has typed a 6-digit number on Sophie's calculator, but Sophie only sees 2007.
How many different numbers could Daan have typed?

A. 10 **B.** 13 **C.** 14 **D.** 15 **E.** 16

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22. We are looking for a four-digit number. The first digit has to be the number of zeros in this number, the second digit has to be the number of ones in this number.
The third digit has to be the number of twos and the fourth digit has to be the number of threes.
How many of such numbers are there?

A. 0 **B.** 1 **C.** 2 **D.** 3 **E.** more than 3

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23. How many numbers under 30 have exactly three deviders?
(Example: the deviders of 12 are: 1, 2, 3, 4, 6 and 12.)

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

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24. In the table alongside Sophie and Daan each cross out four numbers, so eight numbers in total. When you add the numbers that Sophie has crossed out, you will get an answer that is three times as large as when you add the numbers that Daan has crossed out.
Which number isn't crossed out?

4	12	8
13	24	14
7	5	23

A. 5 **B.** 7 **C.** 8 **D.** 13 **E.** 14

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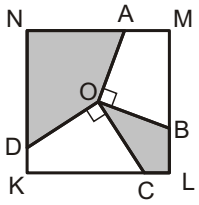
25. In the figure alongside KLMN is a square of side 2.
O is the centre of the square.
OA is perpendicular to OB and OC is perpendicular to OD.
What is the area of the grey region?



A. 1 **B.** 2 **C.** 2,25 **D.** 2,5 **E.** depends on B and C

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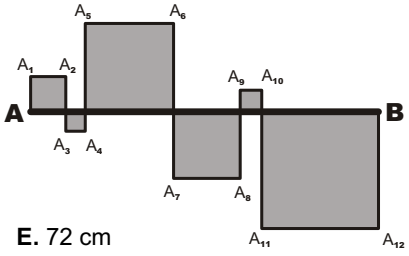
26. The broken line $\mathbf{A}A_1A_2A_3A_4A_5$ and so on till $A_{10}A_{11}A_{12}\mathbf{B}$ is 'curling' around line AB. This way little squares appear in the figure alongside.

How long is the broken line when the straight line AB is 24 cm?



A. 40 cm **B.** 48 cm **C.** 56 cm **D.** 64 cm **E.** 72 cm

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27. Daan and Sam together weigh less than Thomas and Milan.
Thomas and Pim together weigh less than Lars and Sem.
What is definitely true?

A. Milan and Lars together weigh more than Daan and Thomas.
B. Milan and Pim together weigh more than Thomas and Lars.
C. Daan and Pim together weigh less than Lars and Milan.
D. Daan and Sem together weigh less than Thomas and Lars.
E. Daan, Sem and Thomas together weigh as much as Milan, Pim and Lars.

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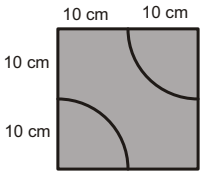
28. The tile in the picture is 20 cm by 20 cm. A floor of 80 cm by 80 cm is being covered with these tiles. The quarter circles on the tiles have to fit together.
That way a beautiful winding line appears.
How many quarter circles can that winding line be at its longest?



A. 15 **B.** 16 **C.** 18 **D.** 20 **E.** 22

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29. We add the digits of a 3-digit number.
We also divide that number by 9.
If you add the digits of the outcome of the division as well, you will get 9 less than at the first addition.
For how many 3-digit numbers does this happen?

A. 1 **B.** 2 **C.** 4 **D.** 5 **E.** 11

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30. A walker is doing a two-hour walk. First he walks part of a flat road at a speed of 4 km/h.
After that he has to go up for a while. His speed then is 3 km/h.
When he arrives at the top he turns back. First the same part down. He can do that fast: 6 km/h.
After that the same flat part again, again at a speed of 4 km/h.
How many km did the walker walk?

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

5 points