THE GEORG MOHR CONTEST 2026

First round

Tuesday, 25 November 2025

Duration: 90 minutes
Aids allowed: none
Tick the answers on the included answer sheet

REMEMBER that there are 20 questions to be answered in a total of 90 minutes. If you cannot solve a problem, it is a good idea to skip it and go on to the next problem.

MULTIPLE CHOICE PROBLEMS

To each of the problems 1 – 10 there are five options, A, B, C, D and E.
One of these options is the correct answer.

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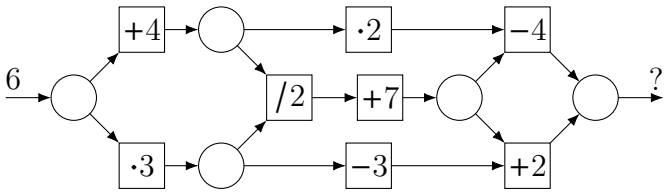
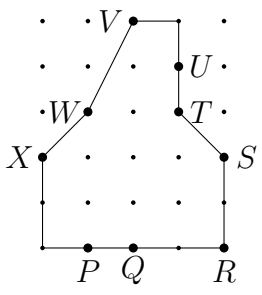
1. Sonya's calculator admits sending a number into the left-hand side and getting a number out on the right-hand side. When the number reaches a round cell, it must exit via one of the arrows. When it reaches a square cell, one uses the operation shown in the cell on the number and sends the result along the arrow.



What is the largest number one can get out by sending the number 6 into the machine?

A) 16 B) 17 C) 18 D) 19 E) 20

2. Which one of the following line segments divides the figure into two parts with the same area?



A) QV B) PU C) QT D) XS E) RW

3. In the expression below the symbols ∘, △ and □ stand for plus, minus and times, but not necessarily in that order.

$$15 \circ 2 \triangle 7 \square 8 = 9$$

Which of the symbols stands for minus?

A) ∘ B) △ C) □ D) it can be both ∘ and □ E) it can be both △ and □

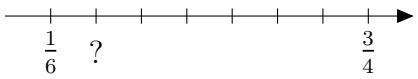
4. A positive integer m satisfies that the last digit of the number

$$m \cdot 2023 + 1661 \cdot 2024 + 5415 \cdot 2025 + 3570 \cdot 2026$$

is 0. What is the last digit of the number m?

A) 5 B) 6 C) 7 D) 8 E) 9

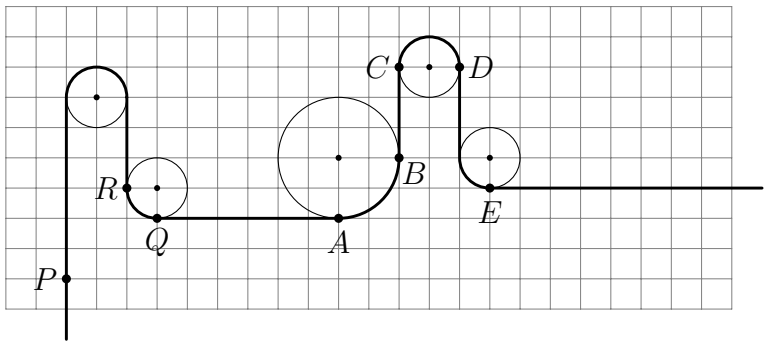
5. The figure shows a number line where two numbers are indicated.



Which number should be written at the question mark?

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{7}$

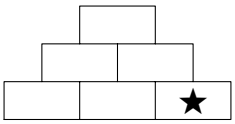
6. A rope is wound tight around the shown wheels. The rope is pulled to the right, causing the point P to end up at the point Q.



At which point does the point R end up?

A) A B) B C) C D) D E) E

7. Georg's younger brother has built a tower using six bricks as shown.



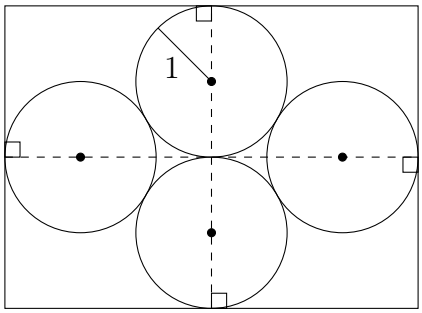
In each round he removes a random brick among those which do not have any bricks on top of them. What is the probability that the brick marked with ★ is removed as brick number 3?

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{1}{6}$ E) $\frac{1}{7}$

8. Four numbers a, b, c and d are known to satisfy that $a + b = d$, that $c > b + d$ and that $a > c$. What do we know with certainty?

A) $a < 0$ B) $b < 0$ C) $c < 0$ D) $d < 0$ E) all four numbers are positive

9. The four circles in the figure are tangent to each other and to the rectangle. All the circles have a radius of 1. What is the area of the rectangle?



A) 4π B) 20 C) $\sqrt{500}$ D) $8 + 8\sqrt{3}$ E) $8 + 4\pi$

10. How many positive integers x less than 200 satisfy that

$$\frac{1}{x} + \frac{1}{2x} + \frac{1}{3x} + \frac{1}{4x} = \frac{1}{n}$$

for some positive integer n?

A) 1 B) 4 C) 7 D) 9 E) 199

ANSWER PROBLEMS

The answer to each of the problems 11 – 20 is a positive integer

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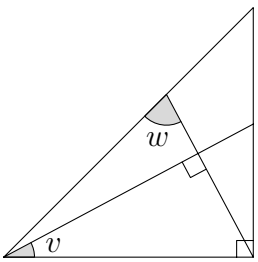
11. A 12-digit number x consists of three 3's, four 4's and five 5's. All the 3's appear before all the 4's (i.e. to the left of all the 4's), and nowhere do two identical digits appear next to each other. What is x?

12. In an isosceles right triangle, two perpendicular lines are drawn and two angles v and w are marked. How many degrees is the angle $w - v$?



13. Diego uses ten different secret symbols – one for each of the ten digits – when he wants to write numbers. He writes the numbers from 1 to 10000 in order. Here is an excerpt from the sequence:

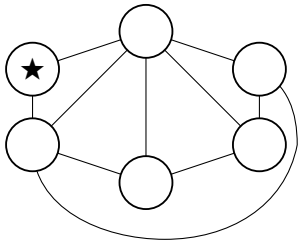
$$\ldots, \sqcup\sqcup\sqcup\sqcup, \ \sqcup\sqcup\sqcup\square, \ \sqcup\sqcup\square\otimes, \ldots$$

Which number is $\square\otimes\sqcup\otimes$?

14. Vibeke rolls a 6-sided die 2026 times, writes the results on a list and then adds them up. She gets the sum 12155. How many different lists can yield this sum?

15. The distance between Armstad and Benby is 36 km. Carl starts in Armstad and bikes towards Benby at 12 km/h. Dan starts in Benby and bikes towards Armstad at 18 km/h. They start at the same time. How many minutes have passed when they meet?

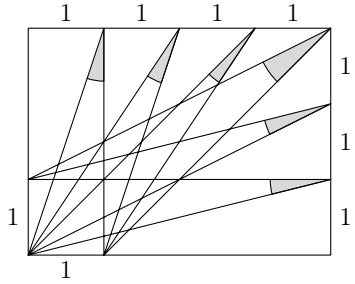
16. The numbers 314, 322, 418, 712, 734 and 824 must be placed in the circles in such a way that two circles are connected if their numbers have the same first digit, the same second digit or the same third digit. Which of the numbers must be written in the circle marked with ★?



17. Around a round table 99 people are seated. Every person says: "Exactly one of the two persons seated next to me speaks the truth". How many of the 99 can at most speak the truth?

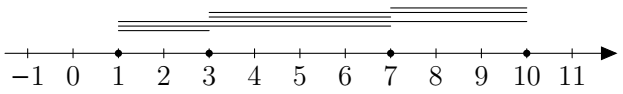
18. Three positive numbers a, b and c are known to satisfy $a^3bc^4 = 2^3$ and $ab^3 = 2^{17}$. What is abc equal to?

19. The figure shows a rectangle. Some lengths are indicated in the figure.



How many degrees are the six marked angles in total?

20. Georg chooses n different numbers on a number line. For each pair of chosen numbers, he draws a line from one to the other right above the number line. If for example $n = 4$, and Georg chooses the numbers 1, 3, 7 and 10, he draws lines as shown.



When Georg has chosen n numbers on the number line, he chooses a new number different from those already chosen and counts how many lines there are directly above it. Georg notices that he can choose both a number with 77 lines above it and a number with 80 lines above it. What is n?

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