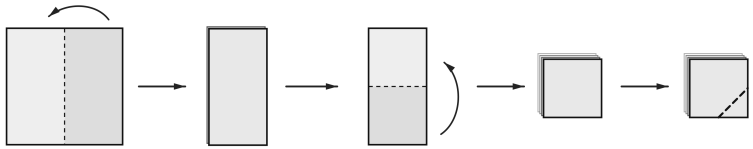
MT Classes Math Olympiad

Ages 9–10 • 60 minutes • October 2026 • English

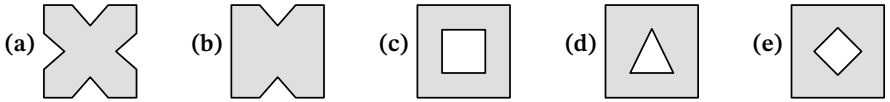
Multiple-choice problems

Each problem has several answer choices. Choose the one correct answer and write it on the answer sheet.

Problem 1 (3 points). A square sheet of paper was folded in half twice, as shown in the figure.



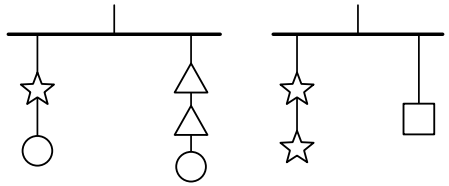
The folded sheet was cut along the dashed line. Which of the figures below is obtained after the sheet is unfolded?



Answer: **(e)**

Solution. When the sheet is unfolded, the cut line is reflected across the fold line each time. After the first unfolding there are two segments, and after the second one — four. They form a diamond-shaped hole in the center of the sheet. Therefore the answer is option **(e)**. □

Problem 2 (3 points). In the figure, all scales are in balance: on each beam, the figures on the left weigh as much as the figures on the right. Identical figures have identical weights. The weights of the beams and strings are ignored.



How many times heavier is the square than the triangle?

(a) 2 **(b)** 3 **(c)** 4 **(d)** 5 **(e)** 6

Answer: 4

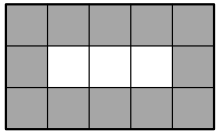
Solution. On the first scale there is a circle on both sides, so it can be removed. This shows that one star weighs the same as two triangles.

On the second scale, two stars balance one square. So the square weighs as much as four triangles. Therefore the square is 4 times heavier than the triangle. □

Short-answer problems

Write only the final answer (a number, an expression, an example, a short statement — as required in the problem). No solution is needed: only the answer is checked.

Problem 3 (5 points).



A rectangle is divided into unit cells. All cells along its edges are colored black, and the rest are left white. For example, the rectangle in the figure has 12 black and 3 white cells.

Draw a rectangle of this kind with 8 more black cells than white cells.

Answer: For example, a 4×4 rectangle.

Solution. A 4×4 rectangle has 16 cells in total. There are 12 black cells along its edges, and 4 white cells remain inside. Therefore there are

$$12 - 4 = 8$$

more black cells than white ones. So the 4×4 rectangle works. □

Problem 4 (5 points).

Lucy wrote a number in each cell of a table. The sums of the numbers in all rows and columns turned out to be equal. Then four numbers were covered with suns. What is the sum of the covered numbers?

☼	5	4	2
3	4	1	☼
6	☼	0	4
2	1	7	☼

Answer: 9

Solution. Since the sums in all rows and columns are equal, the column with the numbers 4, 1, 0 and 7 shows that this sum is 12.

The table has four columns, so the sum of all the numbers in the table is

$$12 \cdot 4 = 48.$$

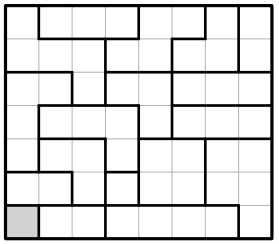
The sum of the known numbers is 39. Therefore the sum of the four covered numbers is

$$48 - 39 = 9.$$

□

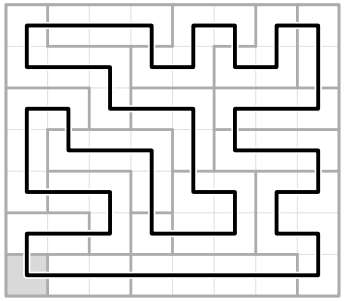
Problem 5 (5 points).

A gardener's plot is a rectangle of 7×8 cells divided into garden beds, as shown in the figure. The gardener starts his walk in the bottom-left cell and ends it in the same cell, returning to it only at the last step. At each step he moves to a cell sharing a side with the current one, and he makes the first step upward. He visits every other cell of the plot exactly once.



The gardener visits each bed, except the one containing the starting cell, exactly once, that is, he crosses its boundary exactly twice: once entering it and once leaving it. Draw the gardener's route.

Answer:



Solution. The required route must be closed and pass through every cell. In each corner cell the direction of the path is determined uniquely: the gardener can enter and leave it only through its two neighbors sharing a side.

Mark these forced parts of the path. Then the condition that each bed can be visited only once determines their continuation uniquely. As a result we obtain a unique route, shown in the figure in the answer. □

Full-solution problems

Write a complete solution: your reasoning, justifications and proof (where required). Both the answer and the reasoning are assessed.

Problem 6 (7 points). In October Kate went for a walk every day. On 16 days rain was forecast, and on those days Kate took an umbrella. On 21 of the 31 days the forecast matched the weather. Katya was never caught in the rain without an umbrella. How many days in October had no rain?

Answer: 25

Solution. On 15 days Kate did not take an umbrella. Since rain never caught her without one, there was no rain on all of those days. So on these 15 days the forecast matched the weather.

In total the forecast matched the weather on 21 days, so on another

$$21 - 15 = 6$$

days the forecast correctly predicted rain. Hence there were 6 rainy days, and the number of days without rain is

$$31 - 6 = 25.$$

□

Problem 7 (7 points). Sixteen cards have the numbers from 1 to 16 written on them, each exactly once. The cards were turned face down, and Mary, without seeing the numbers, took nine of them.

Prove that whichever nine cards she gets, after turning them over there will necessarily be two cards among them whose numbers sum to 17.

Answer: Two such cards will necessarily exist.

Solution. Split all the cards into pairs:

$$(1,16),\ (2,15),\ (3,14),\ (4,13),\ (5,12),\ (6,11),\ (7,10),\ (8,9).$$

In each pair the sum of the numbers is 17. There are 8 pairs in total.

If Mary took at most one card from each pair, she could choose at most 8 cards. But Mary chose 9 cards, so both cards of at least one pair were chosen. The sum of the numbers on them is 17. □