MT Classes Math Olympiad

Ages 11–12 • 90 minutes • October 2026 • English

Multiple-choice problems

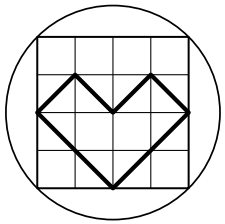
Each problem has several answer choices. Choose the one correct answer and write it on the answer sheet.

Problem 1 (3 points). Misha writes to seven friends every day and to each of nine other friends every other day. Today he wrote to ten friends. How many friends will he write to tomorrow?

(a) 6 **(b)** 7 **(c)** 9 **(d)** 13 **(e)** 16

Problem 2 (3 points).

A square divided into 16 equal squares is inscribed in a circle of diameter 10 cm. What is the perimeter of the figure drawn with the thick line?



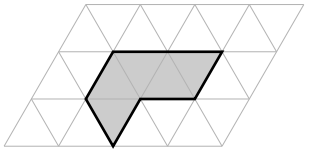
(a) 8 **(b)** 16 **(c)** 20 **(d)** 24 **(e)** 30

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).

On a triangular grid, figures are made of small equilateral triangles with side 1. The figure on the right consists of five such triangles, has perimeter 7 and six vertices. The vertices of a figure are the points where its boundary changes direction.



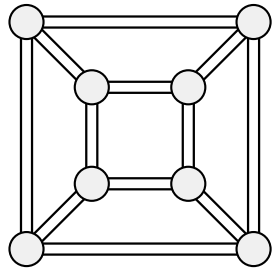
Shade 10 triangles joined to each other along their sides so that the result is a figure without holes, with perimeter 12 and nine vertices.

Problem 4 (5 points). Lydia writes several single-digit numbers on the board, then adds them from left to right and writes down each intermediate sum. For example, starting with the numbers 3, 9, 5, she ends up with 3, 9, 5, 12, 17 on the board, in which the digits 1, 2, 3, 5, 7, 9 appear.

Give an example of four starting numbers such that after the computations every digit from 1 to 9 appears on the board.

Problem 5 (5 points).

A park has 8 circular plazas connected by paths, as shown in the figure. The park director wants to install 14 lamps so that every path is lit by the same number of lamps.



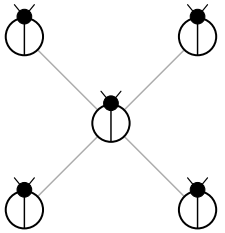
At most one lamp can be placed on each circular plaza, and any number of lamps along the paths. A lamp placed on a plaza lights all the paths leaving that plaza. A lamp placed on a path lights only that path. Give an example of an arrangement of the lamps.

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).

Five ladybugs arranged themselves as shown in the figure. It turned out that the three ladybugs on one diagonal have 15 black dots in total, and the three on the other diagonal have 16 dots in total. The two ladybugs on the left have 14 dots together, and all five together have 26 dots. How many dots do the two ladybugs on the right have together?



Problem 7 (7 points). In a Transfiguration lesson, Professor McGonagall waved her wand, and a row of distinct two-digit numbers appeared on the board by itself. The students were given a task: Harry was to erase from the board all numbers divisible by 2, Ron all numbers divisible by 3, Hermione all numbers divisible by 5, and Neville all numbers divisible by 7.

The four of them did the task one after another, but it is unknown in what order. In the end, Harry erased the numbers 32 and 56, Ron erased 24, 33 and 45, and Hermione erased 20, 25 and 35.

It is known that Neville erased exactly three numbers. Which ones?