



Vietnam International Mathematics Competition 2025

Danang City, 14th to 19th August 2025

Elementary Mathematics International Contest

Individual Contest

Time limit: 90 minutes

Information:

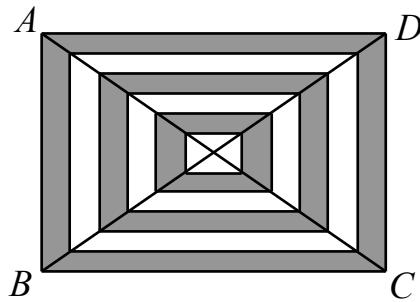
- You are allowed 90 minutes for this paper, consisting of 15 questions to which only numerical answers are required.
- Each question is worth 10 points. No partial credits are given. There are no penalties for incorrect answers, but you must not give more than the number of answers being asked for. For questions asking for several answers, full credit will only be given if all correct answers are found.
- Diagrams shown may not be drawn to scale.

Instructions:

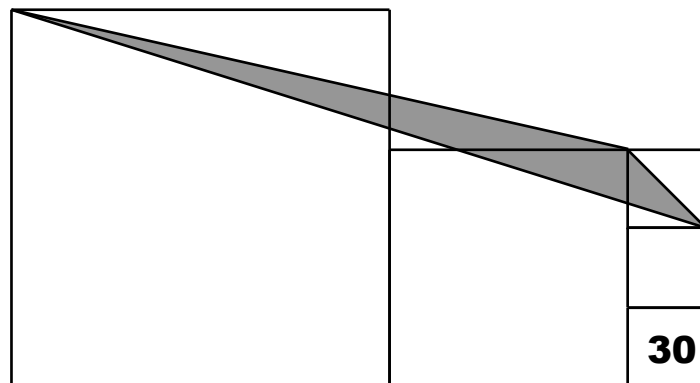
- Write down your name, your contestant ID and your team's name on the answer sheet.
- Enter your answers in the space provided on the answer sheet.
- You are allowed to use HB, B, and 2B pencils and ball-point pens with black or blue ink.
- You cannot use instruments such as protractors, calculators and electronic devices, smart watches.
- At the end of the contest, you must hand in the envelope containing the question sheets, the answer sheet and all scrap paper.

English Version

- In the diagram below, both diagonals of the rectangle $ABCD$ are divided into 12 equal segments. If the total area of all the white regions inside the rectangle $ABCD$ is 10 cm^2 , then what is the total area, in cm^2 , of the shaded regions?



- Ten friends were sitting at a round table. Following the clockwise direction, each of them was asked: "What is the sum of the ages of your two neighbours?" The answers (given in the same order) were: 20, 22, 24, 26, 28, 30, 32, 34, 36 and 38. How old is the person who answered 26?
- Alvin and Bob take turns taking marbles from a bag. Alvin starts by taking one marble, then Bob takes two marbles, then Alvin takes three marbles, then Bob takes four marbles, and so on. If, during a turn, one of them doesn't find enough marbles in the bag, then he takes all the marbles that are left. In the end, Alvin has 101 marbles. How many marbles were in the bag at the beginning?
- Four straight lines are to be drawn on a plane. What is the maximum number of 60° angles that can be formed by these four lines?
- In a mathematics class, students' grades are based solely on exams, all of which carry the same weight. When Eva scored 98 on a certain exam, the average of her exam scores up to that moment increased by 1 point. However, when she scored 70 on the next exam, her average dropped by 2 points. Including these two exams, how many exams had she taken?
- What is the sum of the three largest four-digit numbers in the form \overline{VIMC} such that V, I, M and C are all distinct, V is even, and \overline{VI} , \overline{IM} and \overline{MC} are all two-digit prime numbers?
- For each of the first 2025 positive integers, Tom calculated the product of its digits. What is the sum of all the products Tom calculated?
- Five squares are drawn next to each other, as shown in the diagram below. If the area of each smallest square is 30 cm^2 , what is the area, in cm^2 , of the shaded triangle?



9. The following (incomplete) table records the numbers of students with a given number of marbles:

c	0	1	2	3	...	13	14	15
Number of students with c marbles	9	5	7	23	...	5	2	1

In addition, we also know the following:

- The maximum number of marbles that a student has is 15.
- The students with 3 or more marbles have an average of 6 marbles.
- The students with 12 or fewer marbles have an average of 5 marbles.

What is the total number of marbles combined across all the students?

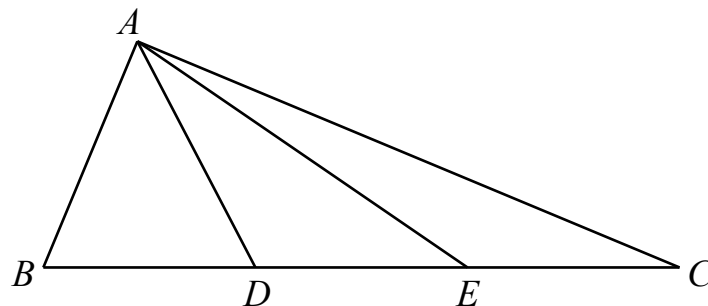
10. Ms. Dao has to place each of the digits 1, 3, 4, 6, 7, 8 and 9 into one of the boxes below, using each digit exactly once, to make a correct equality.

$$\square + \square - \square - \square + \square + \square - \square = 2$$

In how many different ways can she do it?

(Note: Two solutions are considered different if the numbers they filled in differ in at least one box.)

11. In the diagram below, ABC is a right triangle with $\angle A = 90^\circ$, $AB = 15$ cm and $AC = 36$ cm. Let D and E be points on BC such that $BD = DE = EC$. What is the value, in cm^2 , of $AD^2 + AE^2$?

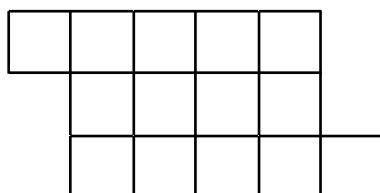


12. Five children, Alice, Bob, Carter, David and Emily, and three adults, Frank, Gary and Henry, are to be seated in a row with eight seats so that:

- No two adults sit in adjacent seats;
- Bob sits to the left of Alice and to the right of Carter;
- David sits to the right of Emily.

In how many ways can these eight people be seated?

13. In how many different ways can the shape below be divided along the grid lines into two identical whole parts (each part has seven unit squares, connected by sides)? (Note: Two parts are identical if they can be obtained from each other by a finite number of reflections and/or rotations.)



14. A 7-digit number $\overline{abcdefg}$ is said to be *V-shaped* if it has the following properties:

- No two digits among a, b, c, d, e, f and g have the same value;
- $a > b > c > d$;
- $d < e < f < g$.

How many *V-shaped* 7-digit numbers are there?

15. If p, q and r are prime numbers less than 20 satisfying $p^2 + q^2 = r^3$, what is the largest possible value of $p + q + r$?