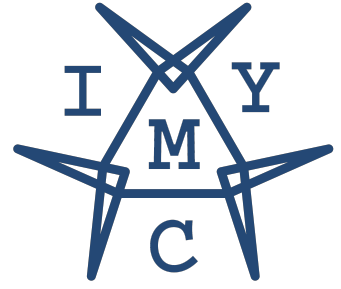


International Youth Math Challenge

Qualification Round 2026



Problem A

Find all real roots of the function $g(x) = (x - 1) \cdot (x + 4) \cdot (\ln x)$.

Problem B

Find all integers n such that this equation holds true:

$$2^n + 2^{-n} = \frac{5}{2}$$

Problem C

Determine the numerical value of the following expression without the use of a calculator:

$$\frac{\log_4(64) - (-1)^{2026}}{2} + \sum_{k=1}^4 \frac{\cos\left(\frac{\pi}{2} + k\pi\right)}{(-1)^{k+1}} + \sqrt{\left(\frac{3}{\sqrt{3}}\right)^2} - 1.$$

Problem D

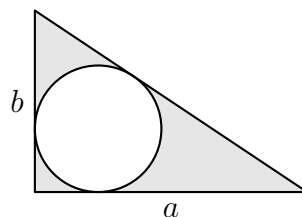
Prove that for every positive integer n ,

$$1 + 2026 + 2026^2 + \dots + 2026^{n-1}$$

is divisible by 2027 whenever n is a multiple of 2026.

Problem E

A right triangle has legs of lengths a and b . A circle is inscribed in the triangle. Find the area of the region inside the triangle but outside the circle.



Submission Information

Each problem gives 5 points. To qualify for the next round, you have to score at least 15/17/20 points as a Junior/Youth/Senior participant. Submit your solution by *Sunday, 27 September 2026, 23:59 UTC+0* online!

Further information and the submission form is available on the competition website: www.iymc.info