



International Youth Math Challenge

Challenge of January to February 2018 | ID 201801

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Problem A

Find the distance from the highest to the lowest point of $f(x) = \cos(x) \cdot \sin(x)$ for $x \in \mathbb{R}$.

Problem B

Show that 5 divides $n^5 + 4n$ for all positive integers n .

Problem C

You have given a sphere with radius R and a cube with side a . You double the radius of the sphere and you double the side of the box. Which volume changes more?

General Information

To successfully solve this IYMC challenge you have to find the solution to at least of the problems above. Choose the problem you find most interesting and try to solve it in a creative way. You can use mathematical as well as algorithmic approaches. Make sure to submit your solution until the *28th February 2018 23:59 UTC+0* on the IYMC website! In case of questions or comments do not hesitate to contact the IYMC team. Good luck.