

# Ask Math Anything

Daily Challenge with Po-Shen Loh

24 June 2020

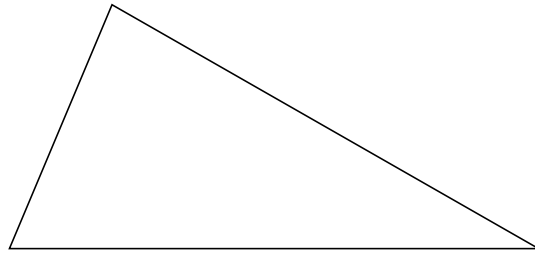
## Abstract

Professor Po-Shen Loh solves problems on his YouTube channel. A selection for practice.

Reference: [Ask Math Anything - Daily Challenge with Po-Shen Loh](#)

## Lengths of Sides of a Triangle

The lengths of the sides of a triangle are 3 consecutive integers. The length of the shortest side is equal to 30% of the perimeter. What is the length of the longest side?



## Base Problem

What is the value in base 10 of the base-3 number  $0.121212\dots$ ?

Fun fact: Base 3 is also called the “ternary numeral system.”

This explains why it makes sense to treat division by  $22|_3$  as division by 99 in base 10.

## Large Mystery Number

A 10-digit number. The first digit is divisible by 1. The number formed by the first two digits are divisible by 2. The number formed by the first three digits are divisible by 3. And so on for 10 digits. What is the number?

## Special 64

Show that 64 is the smallest integer greater than 1 which is both a perfect square and a perfect cube.