



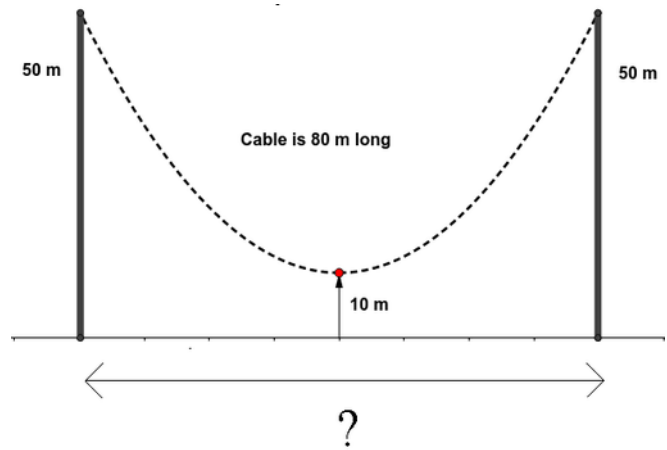
News

Welcome back! We hope you had a good summer holiday; that is if you even noticed that it was the summer holidays after not having been at school since the middle of March. Anyway, now you're back, I hope you still have time to read the maths newsletter. You might find, because you haven't had any proper maths lessons since March, that you have forgotten some things and that you make a few more mistakes than usual. If so, don't worry. Even the best mathematicians sometimes make mistakes. For example, Euler thought that you needed to add at least n n th powers together if you wanted to make another n th power, when $n > 2$, but he was wrong. As I'm sure you know, $27^5 + 84^5 + 110^5 + 133^5 = 144^5$, which is an example of only four fifth powers being added together to make another fifth power.¹ Everyone makes mistakes sometimes. Even Euler.

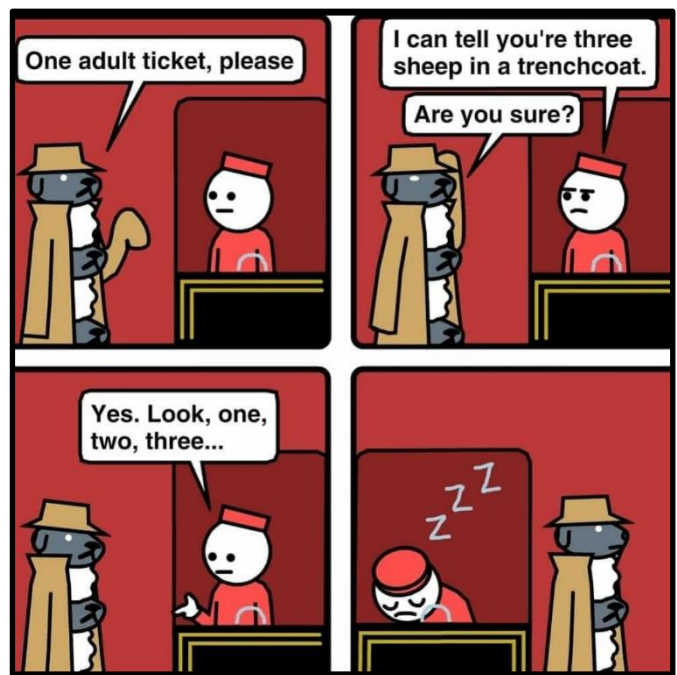


Amazon Puzzle

One company that has been doing well lately is Amazon, which reminds me of a maths puzzle that you may not have seen. It's become known as the 'Amazon interview problem', because it was given to people who had applied to work for Amazon, during their interview. The question is how far apart are the poles?



Joke



Skittles Puzzle

If a new bag of Skittles contains sweets that are 3 times bigger than normal, but there are only half as many sweets in the bag, and the price of the bag is only two thirds of what it was, do you get more Skittle for your money with the new Skittles or with the old Skittles?



1. This is the smallest example there is of four fifth powers being added to make another fifth power.

Maths Word (and formulas)

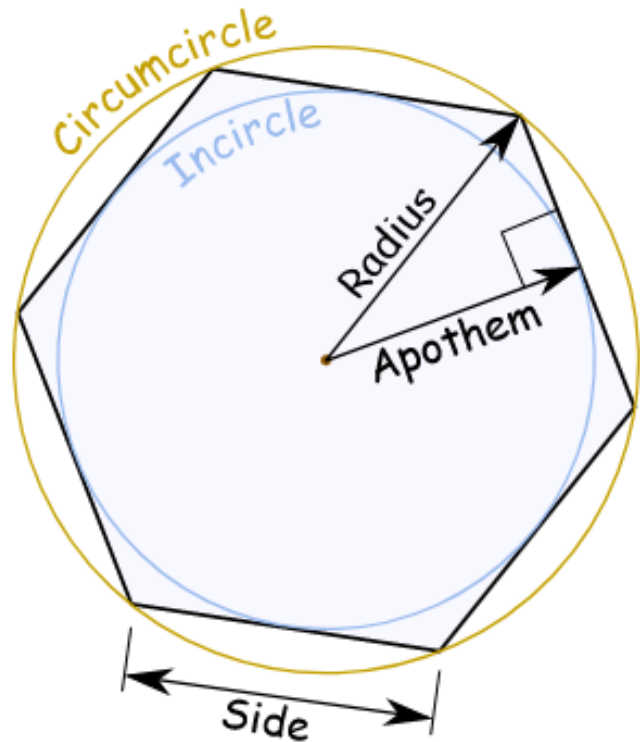
An **apothem** is a line segment which goes from the centre of a regular polygon to the midpoint of one of its sides.

The formula for the length a of an apothem in a regular n -sided polygon with radius r is

$$a = r \cos\left(\frac{360}{2n}\right)$$

or, if you don't know the radius but you know the side length s of the polygon, you can say

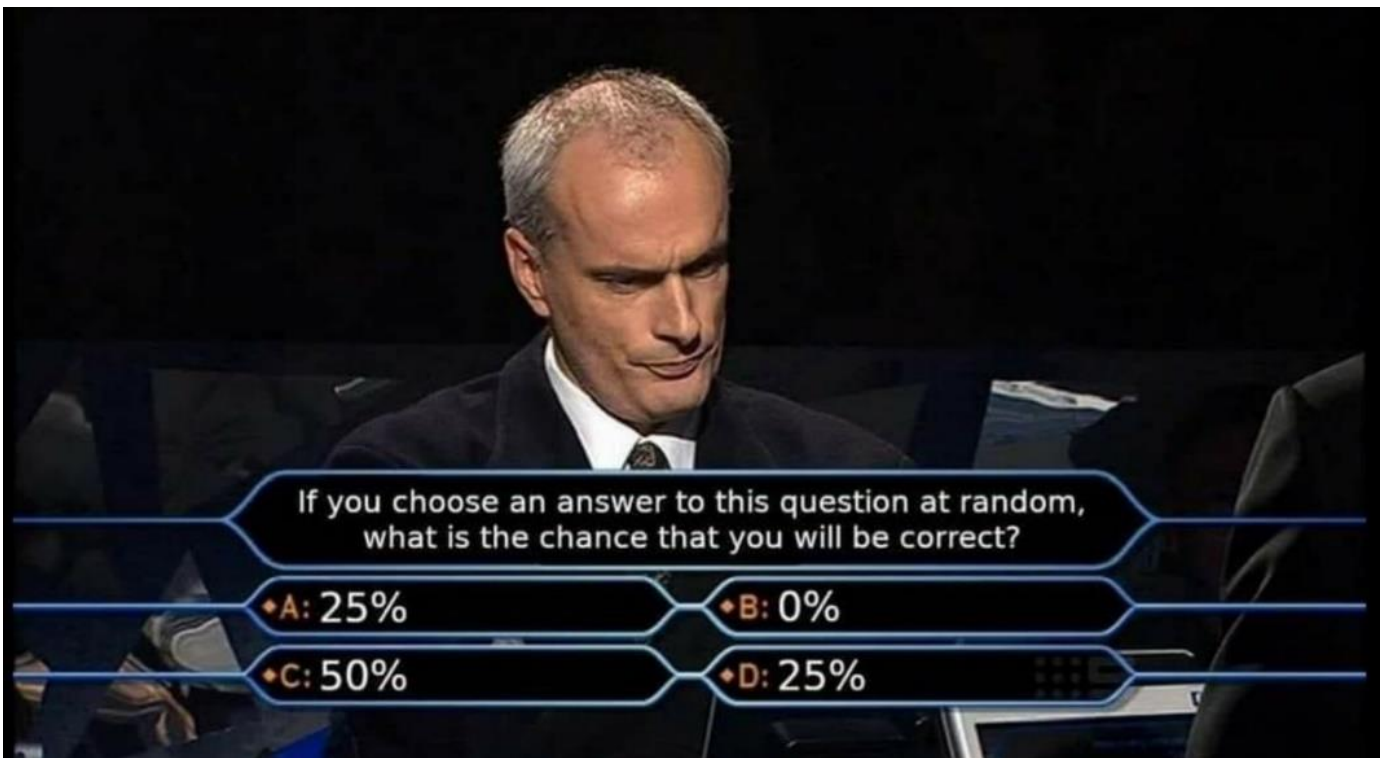
$$a = \frac{s}{2 \tan\left(\frac{180}{n}\right)}$$



Can you see why these formulas work?²

Who Wants To Be A Millionaire?

See if you can work out the answer to this question...³



2. The angles here are measured in degrees.

3. Expect to be more and more confused, the more you think about this.