King Edward VI Camp Hill School for Girls

Maths Department Newsletter

7th May 2020

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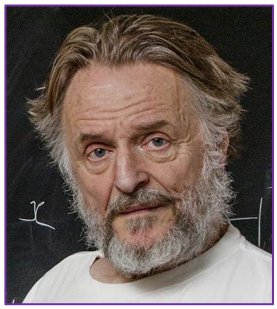
News

We were sad to hear that one of the most famous British mathematicians, John Horton Conway, died from Covid-19 on 11th April at the age of 82. We thought it would be a good idea to start this newsletter by giving you one of his puzzles to have a go at. It's called the Wizard Puzzle and it was written by Conway back in the 1960s.



One night he was travelling home on the bus when he heard two wizards talking. This is what they said.

Blue Wizard: I have a positive integer number of children, whose ages are positive integers. The sum of their ages is the number of this bus, while the product is my own age.

Red Wizard: How interesting! Perhaps if you told me your age and the number of your children, I could work out their individual ages?

Blue Wizard: No, you could not.

Red Wizard: Aha! At last, I know how old you are!

Apparently, the Red Wizard had been trying to determine the Blue Wizard's age for some time. Now, what was the number of the bus?

If this puzzle seems difficult, it's because it is, but don't let that put you off having a go at it.[1] You might also like to look up 'Conway's Game of Life' on Wikipedia. You might really like it.

Puzzle

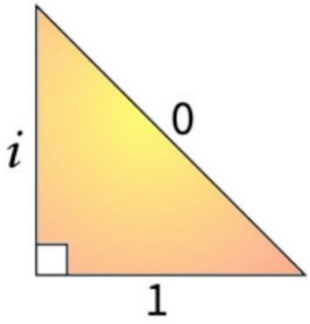
Here's a nice puzzle from Chris Smith.

A chocolate company has a promotion where you can exchange 8 empty wrappers for a free bar of chocolate!

A friend gives you 71 empty wrappers. How many bars can you get using this deal if you have no extra money?

A Weird Triangle

Look at this right-angled triangle. It seems to obey Pythagoras' theorem, doesn't it?



What do you think? Does it exist?

Did You Know?

If you multiply a number by itself, it's called a **square number**, but if you multiply two numbers together that are different sizes, the answer is called a **rectangular number**.[2]

1. You can find a solution to the wizard puzzle here: https://www.popularmechanics.com/science/math/a27416/solution-to-riddle-of-the-week-34/
2. It's not really. I just made that up. But it should be, shouldn't it?

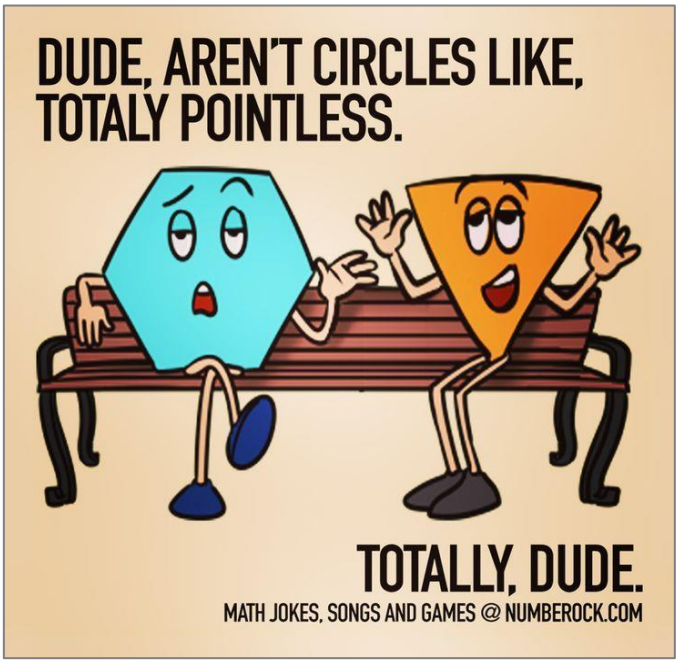
Square Numbers

What do you get if you square 17, 18 and 19? These might seem tricky, until you realise you can use the 4 times table to help you. You know 17^2, 18^2 and 19^2 must end with 9, 4 and 1 (because that's what 7^2, 8^2, and 9^2 end with). The first parts of the numbers are just 7, 8 and 9 multiplied by 4, so 17^2, 18^2 and 19^2 are 289, 324 and 361.[3]

Maths Fail

In the early 1980s, an American company called A&W tried to compete with the McDonald's Quarter Pounder by selling a one third pound burger at a lower price. The product failed though, because most customers thought that one third was less than one quarter.

Maths Joke



Free Stuff

The Mathematical Association have made some mathematical resources available to download for free while many of you are studying and working at home.

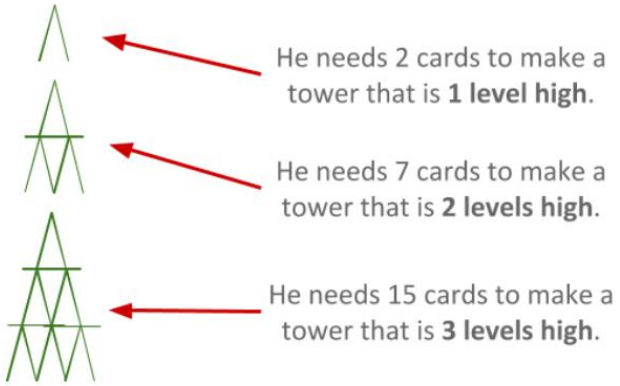
Mathematical Pie is aimed at students from 10 to 14 years of age, but is read by all age groups. Each issue contains a variety of problems and challenges.

SYMmetryplus contains articles, puzzles and competitions for anyone who enjoys mathematics. It's aimed students from 10 to 18 years and is usually only available to members of SYMS - the Society of Young Mathematicians. You can find these at https://www.m-a.org.uk/

How Many Cards?

You might also enjoy looking at a website called www.puzzleoftheweek.com. This week's puzzle was from Chris Smith.

Chris builds towers out of playing cards.



How tall could he build the tower using just 52 cards? How many cards would Chris need to build a tower *n* levels high? Let us know if you work out the answers! Have a good week!

3. Learning square numbers is actually quite a fun thing to do. There are lots of patterns to discover, such as the fact that 12 x 12 = 144 and 21 x 21 = 441, the reverse of 12 x 12. Can you find any other pairs of numbers that are the reverses of each other and whose squares are also the reverses of each other?