**There are 5 Platonic solids**

News

Welcome to the fifth maths newsletter.[1] Some of you may have read the article in the November 10th issue of the *Journal of Mathematical Physics* about π.[2]

$$\frac{\pi}{2} = \frac{2 \cdot 2}{1 \cdot 3} \frac{4 \cdot 4}{3 \cdot 5} \frac{6 \cdot 6}{5 \cdot 7} \cdots$$

A connection has been found between John Wallis's formula for π, published in 1655 (above) and quantum mechanics. The same formula has been found in quantum mechanical calculations of the energy levels of a hydrogen atom. "It brings out a beautiful connection between physics and maths," said the researchers, who were fascinated "that a purely mathematical formula from the 17th century characterises a physical system that was discovered 300 years later." It seems to have something to do with orbits of electrons. Why not look it up on the internet? If you understand it, we'd love for you to explain it to us. Thanks to Chris Smith @aap03102 from Grange Academy for telling us about this.
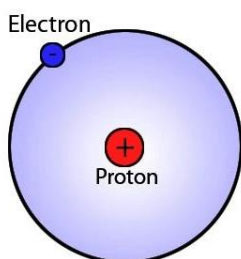
Did you know?

Double Stuff Oreos only have about 1.86 times the amount of stuff in them!? We'd say we think that really takes the biscuit, but it would be a rubbish joke, so we won't…

## Maths Word

A 'hypercube' is a four dimensional shape. Just as a 3D cube is made up of 6 squares, a 4D hypercube is made up of 8 cubes, folded in four dimensional space. Of course, the picture you are looking at is only a two dimensional representation of a three dimensional representation of a four dimensional shape. This kind of thing is why we like maths, by the way… in case you were wondering…
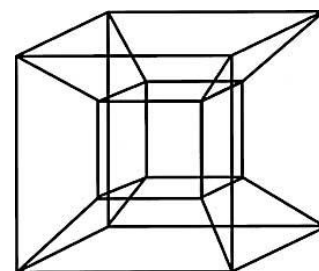
UKMT Team Challenge

On Thursday 26th November our senior team (I-J, Jess, Kate and Saabreen) took part in the senior team challenge competing with 23 other teams from local schools. We didn't win this time, but it was still a fun day.

Joke

Why do mathematicians confuse Halloween with Christmas?

Because Oct 31 = Dec 25

1. This will probably be the last newsletter where I say the number of the newsletter.
2. Joke.

Competition

BRITISH SOCIETY
FOR THE HISTORY
OF MATHEMATICS

The British Society for the History of Mathematics (can you tell what their logo is?) has announced a new competition that you may be interested in. This is what they say (I've cut this down quite a bit so it will fit):

Where does mathematics come from? How do we know it's true? What is the contribution of a particular person or culture?

We invite secondary school students to explore these questions and communicate their findings for a wide audience (age 16 upwards).

You could write an article (maximum 1500 words), make a short video (maximum ten minutes) or a multi-media project (maximum ten minutes).

The competition is open to all young people aged 11 to 19 who are in secondary education. A number of monetary prizes will be awarded. The maximum prize will be £100. Winners will be announced on 21 May 2016.

If you are interested, read the full article at http://www.bshm.ac.uk/plus
We think you should seriously consider entering this competition, because when girls from Camp Hill enter competitions like this, we often win! ☺

(The Fault in)² Our Stars

You may remember these lines from the popular book *The Fault in Our Stars*:
"There are an infinite set of numbers between 0 and 1. There's .1 and .12 and .112 and an infinite collection of others. Of course there is a bigger set of infinite numbers between 0 and 2, or between 0 and a million. Some infinities are bigger than other infinities. A writer we used to like taught us that. There are days, many of them, when I resent the size of my unbounded set."
Although we love the idea of putting maths into novels, the maths here is a little bit… faulty might be a good way to put it. Some infinities are bigger than others, but the ones John Green mentions, between 0 and 1, 0 and 2, and 0 and a million, are actually all the same size.[3] We call it Aleph-1. Also, none of those sets are unbounded. Infinity is a weird topic and things don't usually work in the way you might expect. Why not ask your maths teacher to explain it? ☺

Apology

The writers of the maths newsletter would like to offer an apology to Miss Smallman. We did not intend to suggest that Miss Smallman, or any friend of Miss Smallman, would ever knowingly damage an endangered plant. As for the piece of plant pictured in the last maths newsletter, Miss Smallman assures us that it was already dead and that she found it on the floor.

The Next Newsletter

As it will soon be Christmas, expect a ton of new stuff in the next newsletter ☺

3. To be fair to John Green, he has said that he knew that these sets were actually all the same size. He said that although he understands how infinities work, he didn't think the character in the story would.