King Edward VI Camp Hill School for Girls

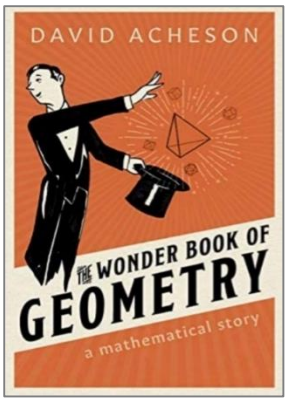
Maths Department Newsletter

19th April 2021

86 = (8 × 6 = 48) + (4 × 8 = 32) + (3 × 2 = 6)

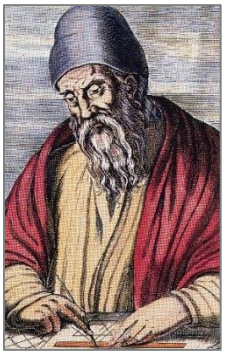
News

As I'm sure you are aware, there are many different kinds of mathematics. One of the oldest is called **geometry**, and you study it in school. Some examples of geometry are the theorems you know about angles and parallel lines[1], loci, similar and congruent triangles, circle theorems, Pythagoras' theorem, the formulas for the area of a triangle and the volumes of solids such as cylinders, spheres and cones, as well as all the work we do on constructing polygons in year 8. Anyway, sometimes students ask us if we can recommend a good book about maths for them that would extend their knowledge in an interesting way, so we just thought we would let you know that Mr Taylor's favourite popular maths author David Acheson has recently published a new book called *The Wonder Book of Geometry*. He read this book over the Easter holiday[2] and asked me to pass on to you that it's a really great book and if you are looking for a book about maths to read, then he would definitely recommend it. To go with the geometry theme of this newsletter, I'll also include some of Catriona Shearer's geometry puzzles that you can find on Twitter by following **@Cshearer41**. Let us know if you solve any of them!

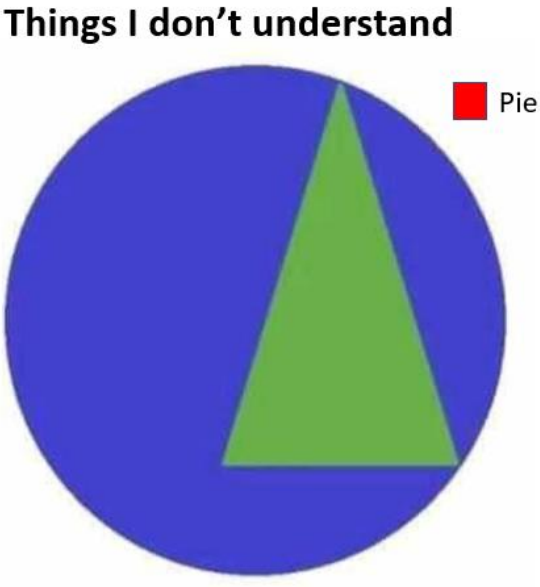


Maths Word

The word **geometry** (from the Greek words '**geo**' and '**metron**' meaning 'earth' and 'measurement') literally means to measure the earth[3], but what we mean by it today is the study of points, lines, shapes, surfaces and solids. It was established by the ancient Greeks, most famously in the thirteen 'books' called *The Elements* (although the books are really more like big chapters), written by Euclid of Alexandria around 300 BC. By starting with 5 facts that Euclid considered to be obviously true, he went on to prove 465 other theorems, including the fact that the angles in a triangle add up to 180°, and also Pythagoras' theorem.



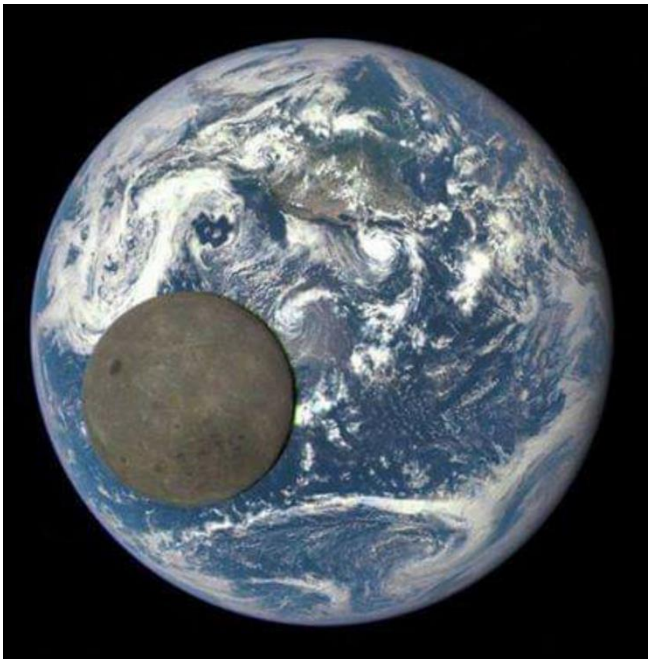
Joke



1. Remember alternate, corresponding, opposite, and allied angles? You need to know these words for GCSE.
2. Because remember, your teachers never do anything at all ever that is not related to the subjects they teach. Also, even though you may have seen some of them 'going home' at the end of the school day, they are just pretending, and as soon as it's quiet they sneak back into school, which is where they all really live.
3. Not surprisingly.

Space Geometry

The moon passed between Nasa's Deep Space Climate Observatory and the Earth allowing the satellite to capture a rare image of the moon's far side[4] in full sunlight.



So here's the maths puzzle. In the picture, the Earth's diameter is 2.7 times the diameter of the moon. In reality, the Earth's diameter is 3.7 times that of the moon and the diameter of the moon is 3,474 km. If the distance from the Earth to the moon is 384,000 km, roughly how far away from the moon was the camera when it took this photograph? Let us know how you get on with this![5] Anyway, here's a different kind of puzzle…

UKMT Puzzle

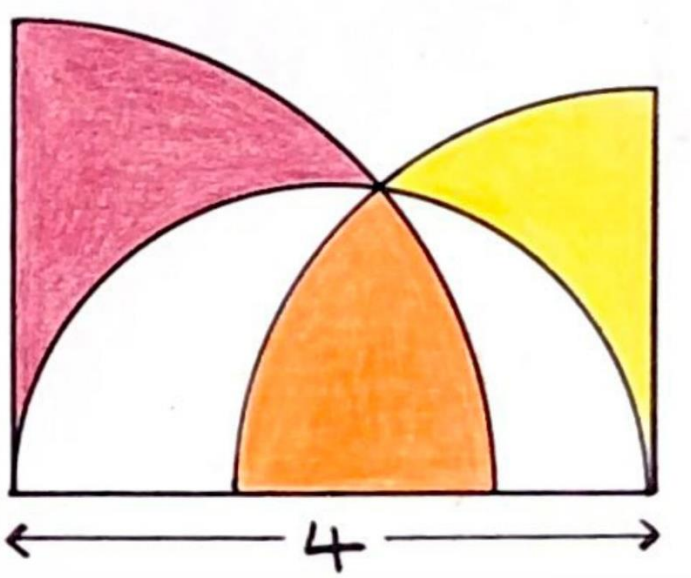
$$10^{16} - 3^{16}$$

Which is the smallest prime number that is a factor of $10^{16} - 3^{16}$?

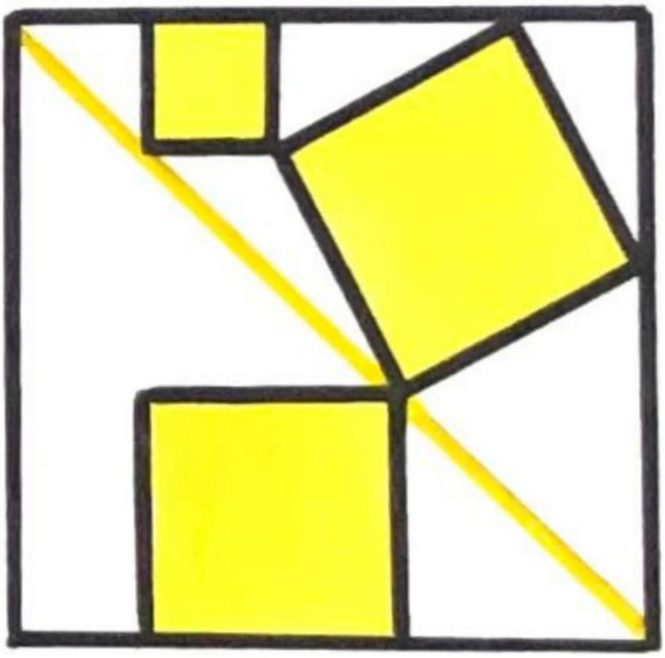
Geometry Puzzles

Here are some geometry puzzles from Catriona Shearer.

1. Two quarter-circles and a semicircle. What's the total shaded area?



2. Four squares. What fraction is shaded?



Don't Forget!

Don't forget to get your house points, join the virtual maths club, join the chess club, and let us know if you solve any of the puzzles in this newsletter!

4. Remember, the 'dark side' of the moon is not a thing. It's not dark – well, not all the time anyway.
5. Do you need to use all the numbers you were given there to solve this problem?