



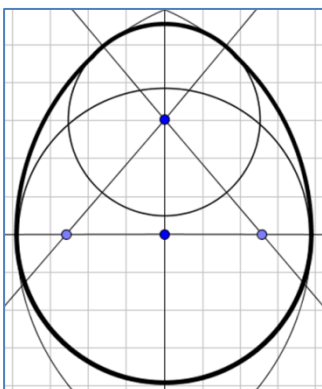
There are 13 Archimedean solids

Happy Easter

During the next few weeks you will almost certainly see somebody eating Cadbury's Mini Eggs and, when you do, why not ask them if they knew that the correct mathematical name for the shape of an egg is an 'ovoid'? This is the 3D version



of an 'oval', which literally means 'like an egg', because 'ovum' is Latin for 'egg'. An oval doesn't have a precise definition in terms of a mathematical equation, because different eggs can be different shapes¹, but some ovals can be constructed using geometry, like this one, using circular arcs. Of course, you may want to avoid ovoids this Easter. That's up to you, but for now, let's move on...



IMOK

Following the Intermediate Maths Challenge, Naiya Patel qualified for the Intermediate Mathematical Olympiad, and Kate Pham, Amrit Phull, Sherin Thambu, Hannah Tatman, Sarah Peters, Nicole Demitry, Spardha Raut and Megha Bhalla all qualified for the Intermediate Kangaroo.²



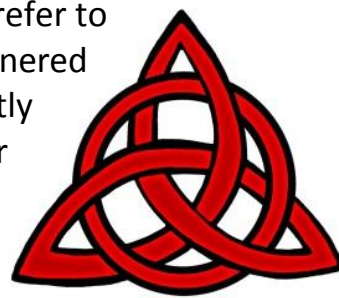
1. This is unavoidable.

2. It's called the Kangaroo as it started in Australia, and also because it's a word that is the same in most languages.

3. Hint: Start by constructing an upside down equilateral triangle, and draw arcs from each of the corners.

Maths Word

A 'triquetra' (from the Latin 'tri' meaning 'three' and 'quetrus' meaning 'cornered') originally meant 'triangle' and was used to refer to various three-cornered shapes. It is mostly used now to refer to this shape, which is also known as a



'trinity knot'. The design, which consists of three arcs (and sometimes a circle, as in this example) was adapted from ancient Celtic images by Christianity to represent the Holy Trinity. Why not see if you can figure out how to construct a triquetra geometrically?³

Team Challenge

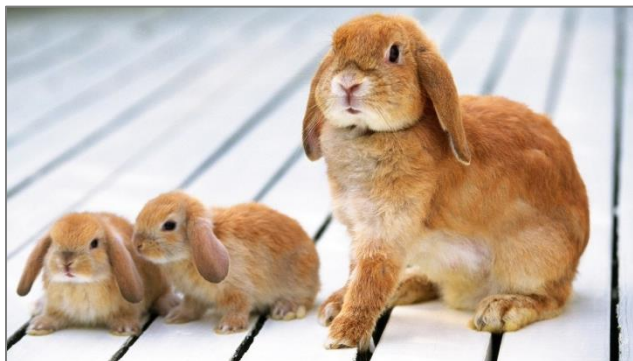
On Tuesday 8th March, two of our year 9 girls (Eleanor and Kujani) and two of our year 8 girls (Kan and Maya) took part in the UKMT Maths Team Challenge next door at the boys' school.



Although we didn't win, we came 3rd out of the 26 teams that took part, scoring an impressive 178 out of a possible 206 points.

Easter Bunnies

In the year 1202, the mathematician Fibonacci wrote a very important book called *Liber Abaci* that contains a famous maths puzzle about rabbits.



Some rabbits, sitting on a set of parallel lines.

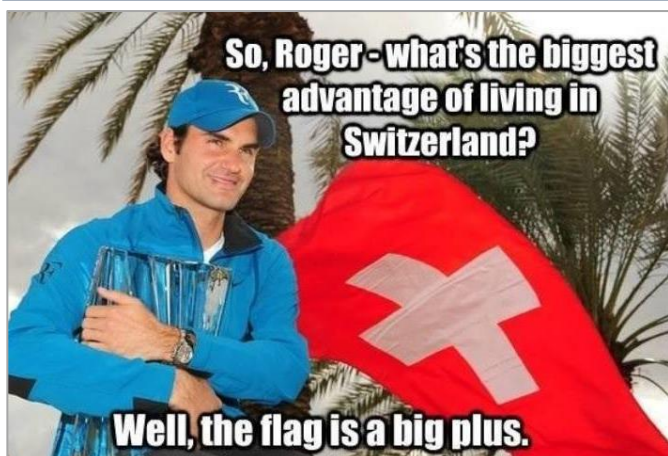
The puzzle goes like this:

Suppose a newly-born pair of rabbits, one male, one female, are put in a field. Rabbits are able to mate at the age of one month so that at the end of its second month a female can produce another pair of rabbits. Suppose that our rabbits never die and that each female always produces one new pair of rabbits (one male and one female) every month from the second month onwards.⁴

How many pairs of rabbits will there be after one year has passed?

Try to work it out. Like I said, the puzzle and its answer are very famous.

Joke



4. These are the kind of rabbits that exist only in maths puzzles.

Puzzles

Here are a few questions from UKMT for you to think about over Easter...

Question 1

p and q are positive integers.
Find pq if $p^3q^4 - p^4q^3 = 37044$

Question 2

Three years ago my nieces' ages were in the ratio 3:4:5, but they are now in the ratio 4:5:6. How old will they be 6 years from now?

Question 3

Find three positive numbers which have a sum of 19 and a product of 240.

Question 4

Which numbers are increased by 500% when they are squared?

Question 5

The difference between a 3-digit number and a 2-digit number is 987. How many pairs of numbers have this property?

Question 6

" $abcd$ " represents a 4-digit number whose digits are all different and non-zero. " ba " = d^2 , $c > a > 1$, and a divides " bcd ". Find " $abcd$ ".

House points are available, as always, for anyone who brings us correct solutions. Have a good holiday ☺