



Every positive integer is the sum of 4 squares

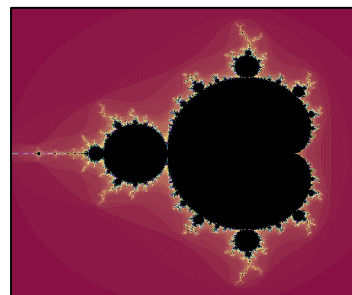
News

Welcome to the fourth maths newsletter. As you can see, the newsletter this week looks like this. The 20th November was the birthday of the mathematician Benoit Mandelbrot, who is famous for making discoveries in the field of fractal geometry. He would have been 91 years old this week.



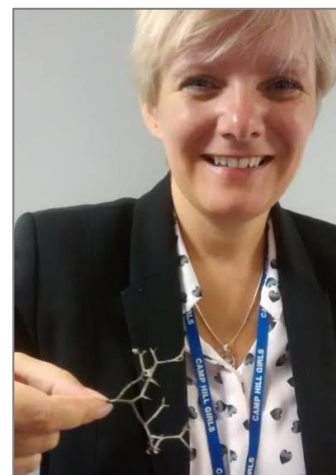
Maths Word

A ‘fractal’ is a pattern whose parts are smaller copies of the whole pattern. Fractals occur commonly in nature. Human lungs are a good example, as are the coastlines of countries. This picture is of a famous fractal called The Mandelbrot Set.



Fractals

Miss Smallman discovered¹ an interesting mathematical plant while on holiday during half-term. It is interesting because it has a very clear fractal structure. We have since found out that the plant is called *launaea arborescens* and is an endangered species. On the back of this sheet is a picture of a sculpture of this plant. Miss Smallman was not aware it was endangered when she picked it.



Maths Olympiad for Girls

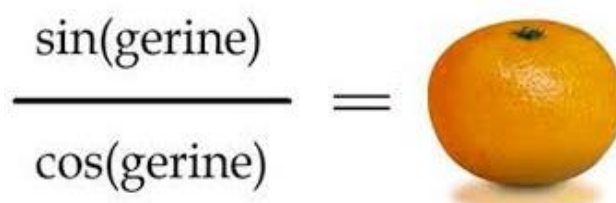
The Maths Olympiad for Girls (or the MOG, as it is usually called) is an event that runs every year, organised by the UK Mathematics Trust. Two of our girls, Divya Khanna in 13S and Kate Pham in 11Y performed extremely well and both received a Certificate of Distinction in this year’s competition.

Maths Quote

“It’s not that I’m so smart, it’s just that I stay with problems longer.” – Albert Einstein.

This is a typical quote from Einstein. Although it certainly is true that he worked on problems for a long time, he was actually really clever too. If you’ve been working on a maths problem for a long time but you’re still struggling with it, why not bring it to Maths Workshop, on Friday lunchtime, in room 13. 😊

Joke



Launaea Arborescens

Here is a photo Miss Smallman took of a sculpture she found of the fractal plant she also found in Fuerteventura.



Birmingham University

The next free public maths lecture to take place at Birmingham University is on Wednesday 18th November at 7:30pm and is called *Transforms: Dark of Matter*. The talk will be about the mathematics involved in creating new types of metals which will be used to build skyscrapers. A-level Further Maths students should seriously consider attending these lectures, along with anybody else who is interested. Why not ask one of your parents to go along with you, if you don't want to go on your own?

1. She was not the first person ever to discover this plant.
2. This is not true. It's just a puzzle. Your teddy is safe.
3. There is some uncertainty about the correct singular of Smarties. I have chosen 'smartie' rather than 'smarty'.

Maths Puzzle

On Friday 13th November, it was the annual BBC Children in Need appeal, featuring the injured teddy bear Pudsey. He's not the only teddy bear to be injured this year though.

70% of all teddies have lost an eye, 75% have lost an ear, 80% have lost an arm, and 85% have lost a leg.²



What is the minimum percentage of teddies that could have lost all four body parts? Can you generalise the solution to this puzzle for any set of percentages?

Did you know?

A Smartie³ is an oblate spheroid with a minor axis of 5mm and a major axis of 15mm. Next time you see someone eating Smarties, why not tell them this?



Don't forget...

Maths Club, for years 7 to 9, is on Tuesday lunchtime in room 14. Also, the deadline for the year 7 *Alice's Cakes* competition is Monday 16th November.

The Next Newsletter

Next time, we'll be looking at the mathematical mistakes in *The Fault in Our Stars*, along with anything else you tell us about. In the meantime, can you work out why the picture of this newsletter on the front of this newsletter is impossible?