



19 is the maximum number of 4th powers needed to sum to any number

News

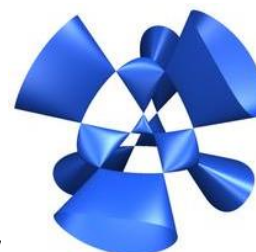
On Wednesday 22nd June we are going to be visited by Dame Frances Kirwan, who will be coming to officially open the new STEM Centre¹. She currently works at Oxford University,



as a Professor of Mathematics. She is also the chairman of the UKMT, which means if you have ever been awarded a certificate for the Maths Challenge, her name and signature will be in the bottom right hand corner. Unfortunately, on your certificate the signature is only a photocopy, but just in case you would like to get her genuine autograph, we have left a blank space in the bottom right hand corner of this newsletter. Dame Frances studied Maths at both Cambridge and Oxford. She then worked as a Junior Fellow at Harvard University, in the USA, before returning to Oxford. Her areas of research include moduli spaces in algebraic geometry, geometric invariant theory (GIT), and the link between GIT and moment maps in symplectic geometry. We don't know what any of those things are, but they sound quite complicated. If you get the opportunity, you may like to ask her some questions. If you would like to ask her a question but don't know what to ask, you might want to choose one from the back of this newsletter...

Maths Word

'Symplectic geometry'² is a branch of differential geometry and differential topology that studies symplectic manifolds; that is, differentiable manifolds with a closed, nondegenerate 2-form. Symplectic geometry has its origins in the Hamiltonian formulation of classical mechanics, where the phase space of certain classical systems takes on the structure of a symplectic manifold.³

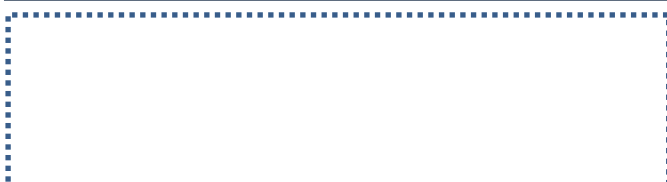


Edge Hill Competition

A team of five girls from year 9 (Anshu, Kujani, Eleanor, Susannah and Anna) have made it through to the final of this year's Edge Hill University Maths Challenge, which takes place on Thursday 7th July near Liverpool. We'll let you know how they get on.



Blank Space



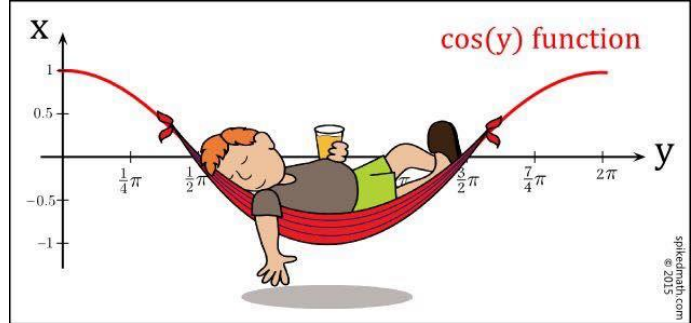
1. You know, those new classrooms they've been building all year above the science labs.
2. Yes, I know this is two words.
3. Don't worry. None of this will be on your GCSE exam.

Possible Questions

1. Why did you choose to study maths?
2. At what age did you decide that you wanted a career in maths?
3. What's your favourite area of maths?
4. Which came first: liking maths, or knowing you were good at maths?
5. What's your Erdős number?
6. Who is the most famous mathematician you have ever met?
7. Do you think the Riemann Hypothesis will be proved in the next 10 years?
8. Can you give a simple definition that we could sort of understand of (pick one of the following)
 - a manifold
 - symplectic geometry
 - a nondegenerate 2-form
 - a phase space
 - moduli spaces
 - geometric invariant theory
 - moment maps
9. Do you understand the proof of Fermat's Last Theorem?
10. Can you remember the last time you did some maths that we would understand?
11. When am I ever going to use the quadratic formula in real life?
12. Which is the better university: Oxford or Cambridge?
13. What do you prefer: pi the number, or pies made of food?
14. What is your favourite number, and why?
15. I've heard that the maths degree at Cambridge is the hardest maths degree in the world. Is this true?
16. What's your favourite maths joke?
17. How many decimal places of pi can you remember?

4. It wasn't.

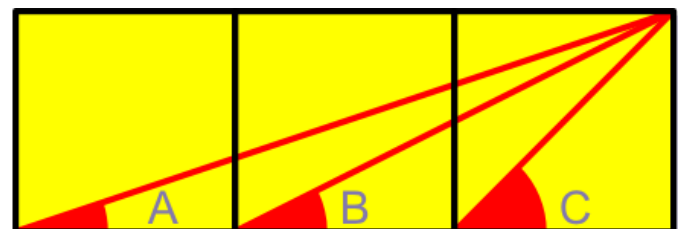
Joke



If you're in year 7 or 8, you won't have heard of the cos function (we don't do trigonometry until the start of year 9). If you're in year 9, you might not know that the graph of the cos function has that curved shape (but now you do). If you're not doing A-level Maths, you might be confused about all those multiples of π on the horizontal axis (that's because radians are being used instead of degrees). If you're wondering why the horizontal axis is labelled y instead of x , that's because the joke wouldn't work unless they did this ('cos x ' isn't a word), and if you're wondering whether this joke was even good enough to actually bother making all this effort to understand it... I know how you feel...⁴

The Three Squares Puzzle

Without using trigonometry, can you prove that angle C equals the sum of angles A and B?



More puzzles like this can be found at puzzles.com. Let us know if you work out a solution.

The answer to the puzzle in the last newsletter was 6.