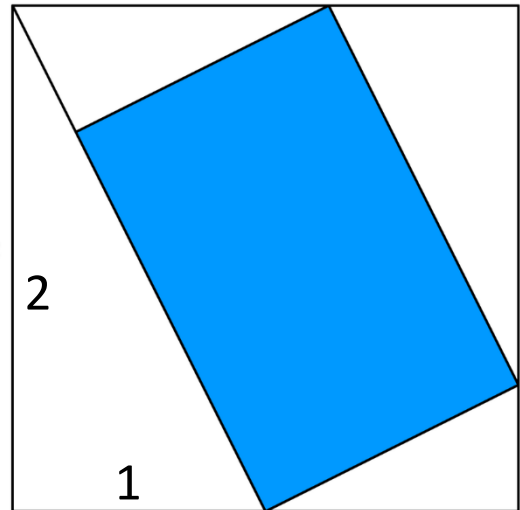**55 is the largest triangular Fibonacci number**

News

Welcome to the latest maths newsletter! Did you know that in Thailand '555' is used by some people as slang for 'ha-ha-ha', because the word for 'five' is pronounced 'ha'? We didn't know this either, but the internet says it's true, so it must be, right?[1] On the back of this newsletter, we have decided to put Dominic Williams's 'Map of Mathematics', because we thought that you might find it interesting. If you want to know more about what each part means, there is a YouTube video that explains it all. Just go onto YouTube and type 'Map of Mathematics'.

Did you know?

"Eleven plus two" is an anagram of "twelve plus one" and they both equal 13. They also both contain 13 letters. How weird is that?

Maths Meme

NOT SURE IF MATH TEST WAS EASY OR I DID EVERYTHING WRONG
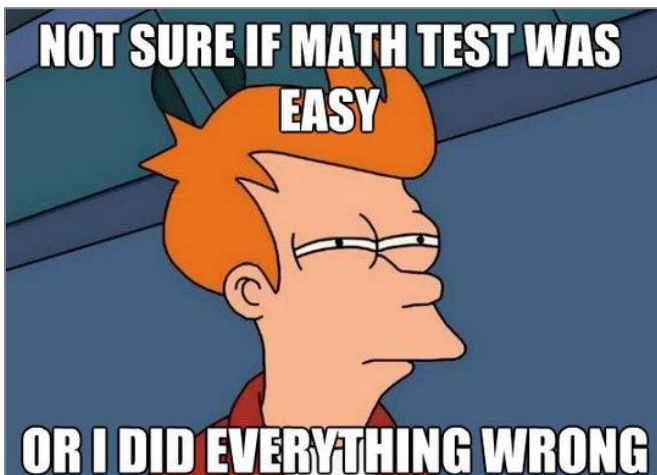
1. If anyone can confirm whether this is true or not, please let us know!

Maths Puzzle

Here's a geometry puzzle from Catriona Shearer (@Cshearer41). The diagram shows a rectangle inside a square. What fraction of the diagram is shaded?

The side length of the square is 2, and the diagonal line from the top left-hand corner ends at the mid-point of the base.

Team Maths Challenge

On Thursday 4th July, a team of six year 9 students competed in the Birmingham South Network Maths Challenge at Swanshurst School. We don't win this every year – we let the boys' school win it every other year so that they don't get too upset. This was one of those years. We still finished in second place though.
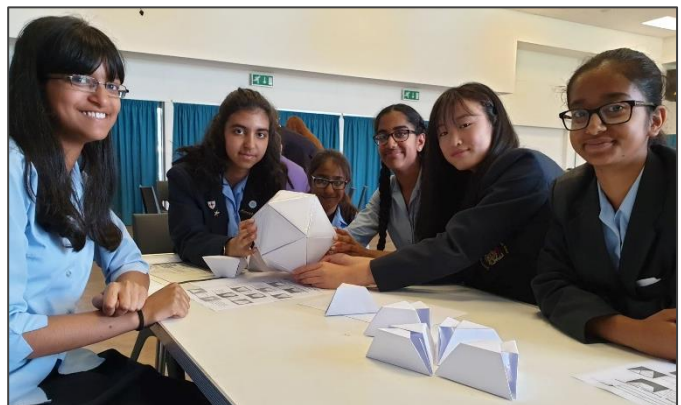
From left to right – Kiera Fernandes, Haaniah Sultan, Aahana Jain, Mamta Garikapati, Tianran Ge, and Mayuri Swaminathan.

THE MAP OF MATHEMATICS

FOUNDATIONS

FUNDAMENTAL RULES

MATHEMATICAL LOGIC

$p \Rightarrow q$

SET THEORY

A, B, A∩B

$g \circ f$

$x \xrightarrow{f} y$, g, z

CONSISTENT SET OF AXIOMS?

GÖDEL INCOMPLETENESS THEOREMS NOPE

CATEGORY THEORY

COMPLEXITY THEORY

P≠NP?

01011002

THEORY OF COMPUTATION

MEASURE THEORY

ORDER THEORY

FACTORS OF 30

PARTITION THEORY

1 1 2 1 3 3 1 1 4 6 4 1

PRIME NUMBERS 1,3,11,907

INFINITY ∞

CARDINAL NUMBERS ℵ₀ ALEPH NULL

OCTONION {e₀,e₁,e₂,e₃,e₄,e₅,e₆,e₇}

QUATERNION a+bi+cj+dk

PI π

EXPONENTIAL e

COMPLEX NUMBERS 3, i, 4+3i, -4i

REAL NUMBERS -4π, √2, e

RATIONAL NUMBERS -7, ½, 2.31

INTEGERS ...-2,-1,0,1,2...

NATURAL NUMBERS 1, 2, 3, 4, 5...

ARITHMETIC + − × ÷

PURE MATHEMATICS

DIFFERENTIAL GEOMETRY

COMPLEX ANALYSIS

TOPOLOGY = 1 HOLE (GENUS 1) MÖBIUS STRIP

FRACTAL GEOMETRY MANDELBROT SET

CHAOS THEORY

BUTTERFLY EFFECT

ECOSYSTEMS

DYNAMICAL SYSTEMS

FLUID FLOW

VECTOR CALCULUS

GROUP THEORY

GRAPH THEORY

TREE

COMBINATORICS

PERMUTATION GROUP

NUMBER THEORY

LINEAR ALGEBRA

MATRICES $\begin{pmatrix} 6 & 7 \\ -3 & 2i \end{pmatrix}$

ALGEBRA

EQUATION $y = mx + c$

$x^4 - 4x - 8 = 5x + 8$
$x^3 - 4x - 36 = 0$
$(x+3)(x^2 - 6) = 0$

VECTORS $\underline{x}$

STRUCTURES

TRIGONOMETRY $\sin(\theta)$ $\cos(\theta)$

PYTHAGORAS

GEOMETRY

SPACES

CHANGES

CALCULUS

DIFFERENTIAL GRADIENT = $\frac{dy}{dx}$

INTEGRAL AREA = $\frac{1}{2} \int_x^x f(x) \, dx$

DIFFERENTIAL EQUATIONS

NUMBER SYSTEMS

ORIGINS

COUNTING 50,000 BCE

NEGATIVE NUMBERS CHINA 200 BCE

FIRST ZERO INDIA c.628

ALGEBRA PERSIA c.820

MATHEMATICAL NOTATION c.1730 $e^{i\pi} = -1$

EGYPT FIRST EQUATION 3000 BCE

GREECE 600-300 BCE

APPLIED MATHEMATICS

CRYPTOGRAPHY

PUBLIC KEY ENCRYPT

PRIVATE KEY DECRYPT

PROBABILITY

BAYES' RULE $P(A|B) = \dfrac{P(B|A)P(A)}{P(B)}$

P(A|B)

COMPUTER SCIENCE

TURING MACHINE

HOMOMORPHIC

```
while awake:
    do_science()
    if self.tired():
        awake = False
    self.repair_brain()
```

MACHINE LEARNING

CAT

GAME THEORY

STATISTICS

OPTIMIZATION

MATHEMATICAL FINANCE

ECONOMICS

ENGINEERING

NUMERICAL ANALYSIS

MATHEMATICAL CHEMISTRY

MATHEMATICAL PHYSICS

THEORETICAL PHYSICS

CONTROL THEORY SENSOR CONTROLLER SYSTEM

BIOMATHEMATICS