BAZINGA!

BUZZER ROUND!

GET READY!

INSTRUCTIONS

- Every team has a buzzer in front of them.
- The fastest team to hit the buzzer gets the first chance to answer.
- A correct answer gets +20 points while a wrong one gets -10.
- The team must answer correctly within 2 seconds of pressing the buzzer to get +20 points, else they get -10.
- If the team fails to answer correctly or hesitates, the question is displayed again and the rest of the teams can buzzzzzz.
- If the next team buzzes incorrectly or no team manages to buzz under 2 minute of opening the question, the question goes to the audience.

ARE YOU GUYS READYYY ?

LETS GO!

Question 1

Find all positive integers n such that $2^{(n-1)}$ divides n!

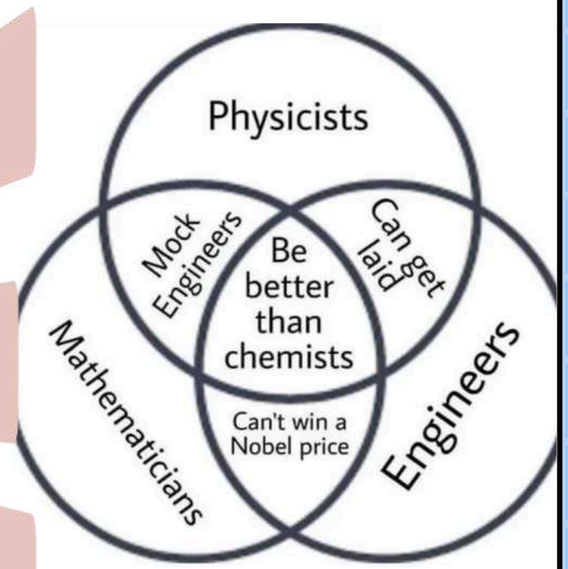
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

SAFETY SLIDE

ANSWER

ALL POWERS OF 2

SAFETY π SLIDE



Question 2

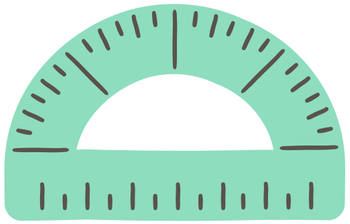
Which of the following famous mathematicians popularised the Hindu-Arabic numeral system, the one we currently use?

A) Al-Khwarizmi

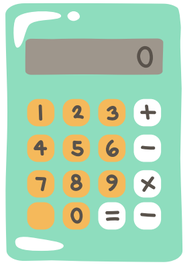
B) Leonardo Bonacci

C) Hypatia

D) Madhava of Sangamagrama



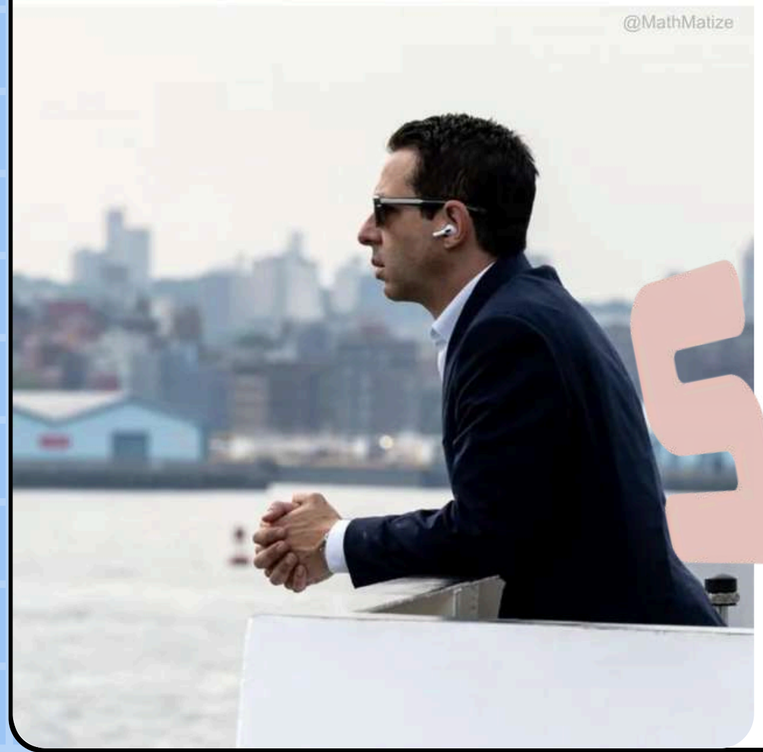
SAFETYSLIDE



ANSWER

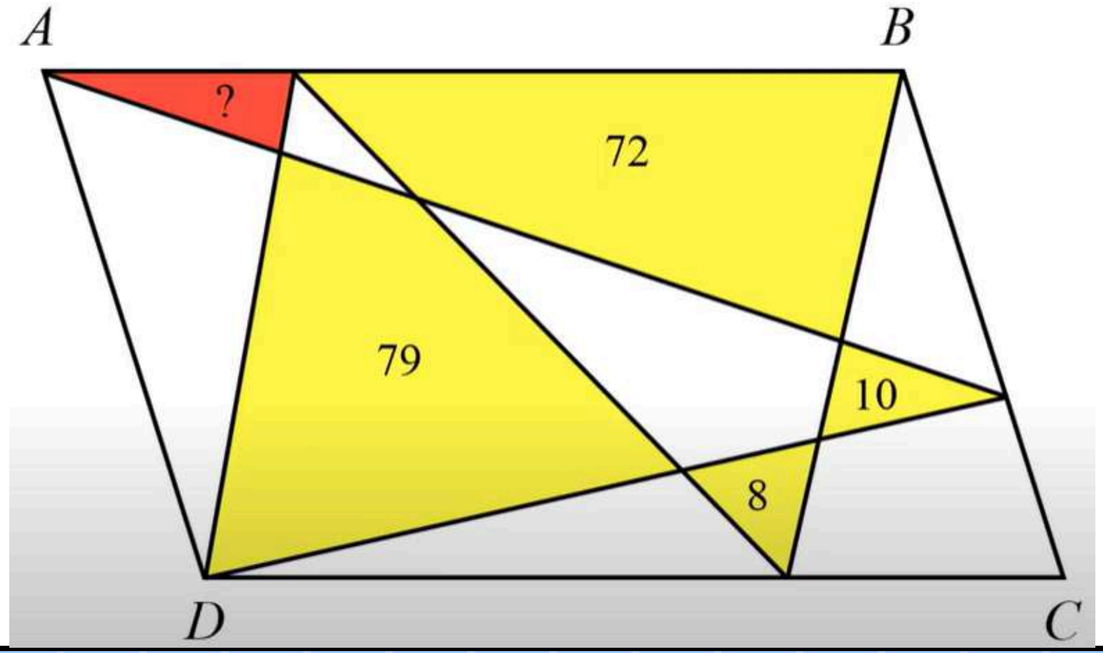
B) LEONARDO BONACCI

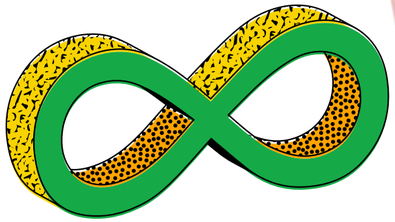
Mathematicians using “we” in the proof they are writing by themself



Question 3

ABCD is a parallelogram. In the diagram, the areas of yellow regions are 8, 10, 72, and 79. Find the area of the red triangle. The diagram is not to scale.





SAFETY SLIDE

ANSWER

9

SAFETY SLIDE

Movie called "Mean Girls"

Nothing to do with statistics

Question 4

Let ABC be an acute scalene triangle. Let D be the point where the incircle touches side BC. Let E be the point where the A-excircle touches side BC. Let M be the midpoint of side BC. Let the inradius of the triangle be 2 and the A-exradius be $2\sqrt{2}$. Find the value of DM/EM.


SAFETYSLIDE

ANSWER

1

Mathematicians who write
“∃” instead of “there exists”
deciding what to do with
the time they saved

Question 5

$\{a_n\}$, $\{b_n\}$ and $\{c_n\}$ are 3 sequences of real numbers such that, for every natural number n

$$\sum a_n = 2n + 1$$

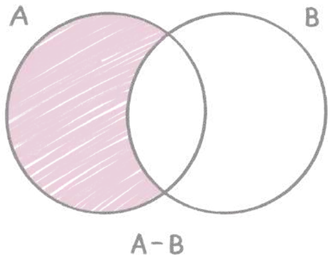
$$\sum_{cyc} a_n b_n = 2n - 1$$

$$a_n b_n c_n = -1$$

$$a_n < b_n < c_n$$

Find $\lim_{n \to \infty} n a_n$

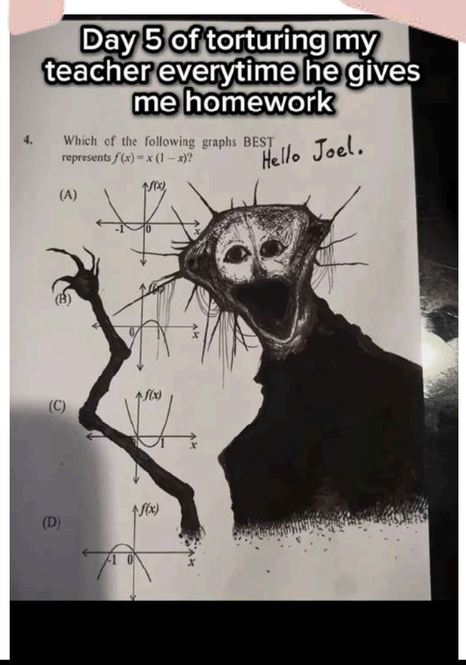
SAFETY SLIDE



ANSWER

$\frac{1}{2}$

SAFETYSLIDE



Question 6

Assuming that all the coefficients of a quadratic equation $ax^2 + bx + c$ are odd integers, which of the following COULD be a root of the equation? (Multiple choice)

$A) 0$

$B) \frac{-7}{6} + \frac{\sqrt{13}}{6}$

$C) -1024$

$D) 0.7892$

$E) 83$

$F) \frac{59}{30} + i\left(\frac{\sqrt{179}}{30}\right)$

SAFETY SLIDE

ANSWER

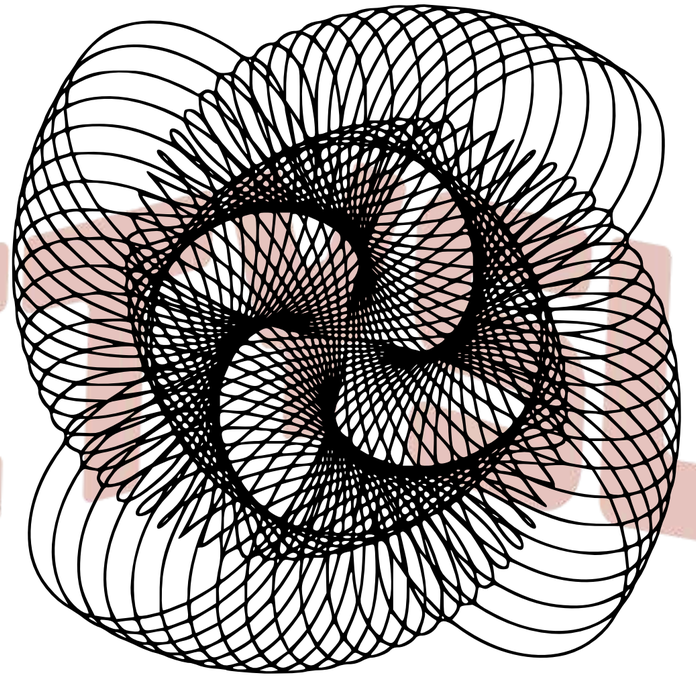
B & F

SAFETY SLIDE

Question 7

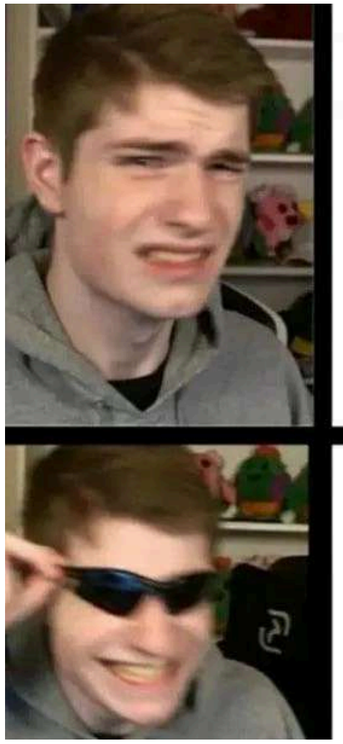
Which famous British mathematician, perhaps best known for other work, also happened to be one of the first people to work on mathematical biology, in particular the chemical basis of morphogenesis? He was also an excellent runner, nearly qualifying for the olympics.

SAFETY SLIDE



ANSWER

ALAN TURING



5.0 ★★★★★ (26)

4.6 ★★★★½ (5,858)

SAFETY SLIDE

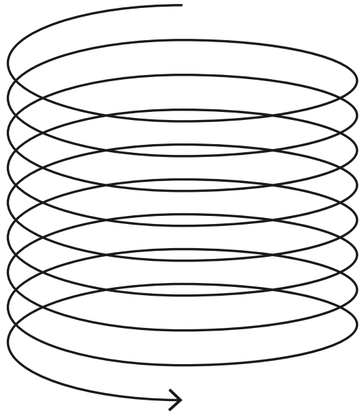
Question 8

A sequence of real numbers satisfies the following for every n

$$a_1^3 + a_2^3 + \ldots + a_n^3 = (a_1 + a_2 + \ldots + a_n)^2$$

Find the value of a_{2025} given $a_1 = 1$.

SAFETY SLIDE



ANSWER

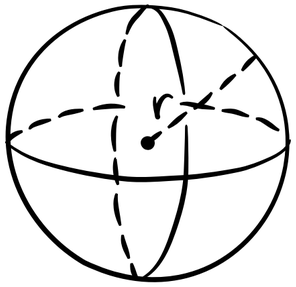
2025

SAFETYSLIDE

Question 9

Determine the smallest prime p such that 2018! Is divisible by p^3 but not p^4.

SAFETY SLIDE



$$V = \frac{4}{3}\pi r^3$$

ANSWER

509

SAFETY SLIDE

Question 12

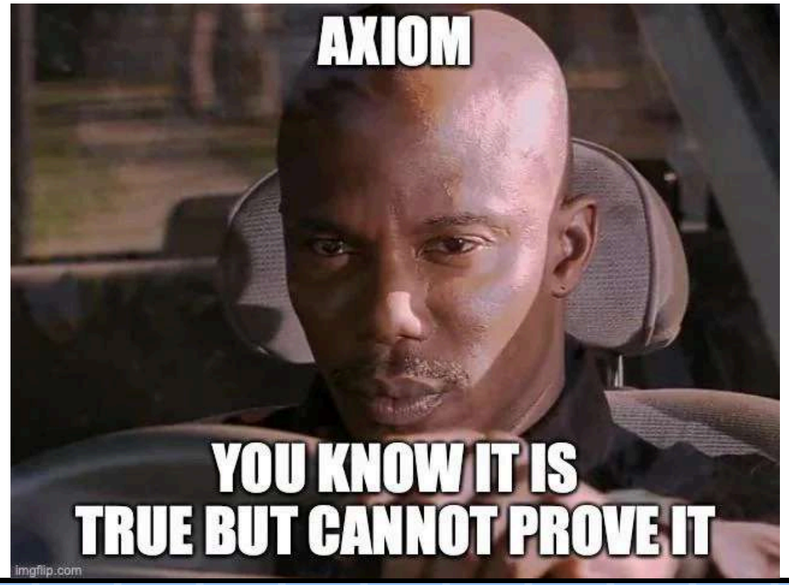
A1,A2,A3,...,A21 be the 21 vertices of a regular polygon of 21 sides inscribed in a circle with centre O. Triangles are formed by joining the vertices of this regular polygon. From these triangles, if a triangle is chosen at random. A = Probability of choosing an acute angled triangle, A = Probability of choosing an obtuse angled triangle. Find A + B.

SAFETY SLIDE

ANSWER

1

SAFETYSLIDE



Question 13

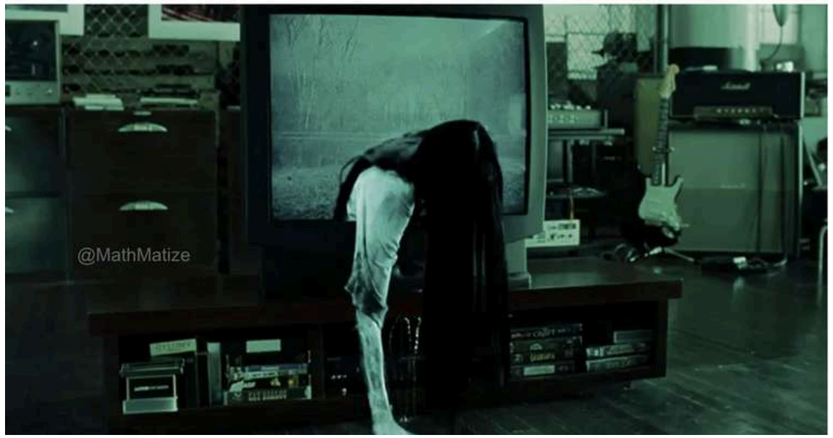
Which mathematician frequented french prisons during the revolution and famously died at 20 while duelling over a love affair gone wrong.

SAFETYSLIDE

ANSWER

GALOIS

Consider $T : \mathbb{R}^2 \to \mathbb{R}^3$



Question 15

How many prime numbers less than 100 satisfy p!! = 5 mod 10

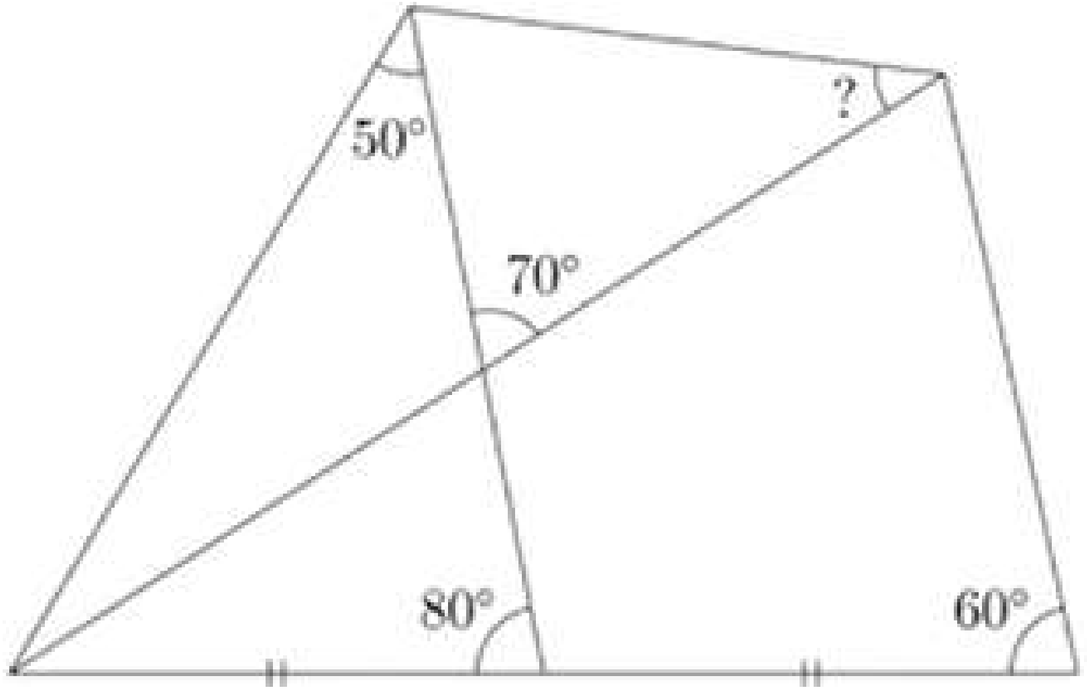
In mathematics, the double factorial of a number n, denoted by n!!, is the product of all the positive integers up to n that have the same parity (odd or even) as n.

SAFETY SLIDE

ANSWER

23

Question 14



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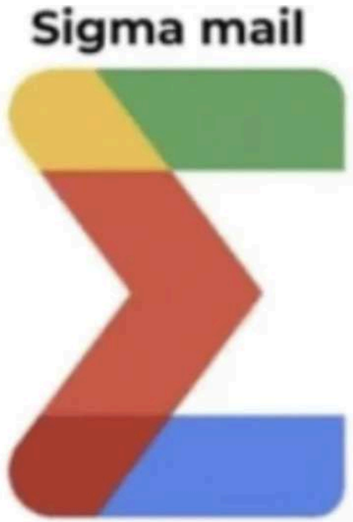

ANSWER

40

SAFETYSLIDE

AAND WE'RE DONE!

HOPE YOU ALL HAD FUN!

UNTIL NEXT TIME :D