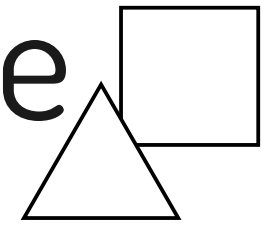
MathsJam Shout

July 2024
London MathsJam

Puzzle
One More!



by @MarHarStar

(In the November 2017 shout, Cheltenham asked an analogous question for 3 pieces - let's go one further!)

Cut a square into 4 similar pieces that are:
(a) all congruent
(b) exactly 3 congruent
(c) exactly one pair of congruent pieces
(d) two pairs of congruent pieces
(e) none of the pieces congruent.
At least one solution exists for the above.

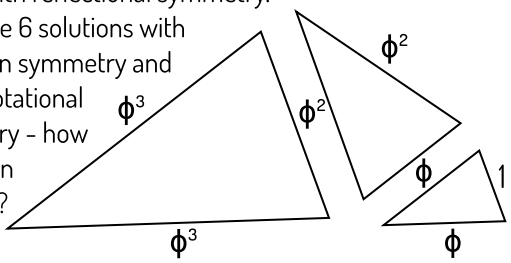
Now do the same for an equilateral triangle.

We have found solutions for four of these - let us know if you find all five!

Make
Golden Ratio Triangles

by Donald Bell

Arrange three golden ratio triangles (angles 72°, 72° and 36°), with sizes as shown, into a contiguous shape with reflectional symmetry. There are 6 solutions with reflection symmetry and 3 with rotational symmetry - how many can you find?



Printable triangles: bit.ly/golden-triangles

Complete the Joke

by Zefram

Compose a joke that begins:
"An infinite number of mathematicians walk into a bar ..."

Share your best responses tagging @mathsjam on Twitter/ Mastodon. Our attempt is upside down in small letters at the bottom of the page, in case you want to avoid spoilers.

Puzzle "1001"

by Zefram

1001 is a multiple of 11. This is true because 1001 = 7×11×13. But if we reinterpret that first sentence as if the numbers were written in binary, then "1001" represents 9 and "11" represents 3, and then the sentence is still true, because 9 = 3×3.

In which other bases is it true that "1001 is a multiple of 11"?

Don't limit yourself to positive integer bases; also consider exotic bases such as -2 (negabinary) and 2i (quater-imaginary).

Puzzle The Race!

by Hexagon Hannah

100 runners take part in a strange mathematical race: they each carry a bag containing 100 balls - 97 red, 3 white - and after each lap, they remove a ball at random in front of an adjudicator, who makes a note of the colour and keeps the ball. Once a runner has removed all three white balls, they have finished the race. After how many laps would you expect half the runners to have finished?

An infinite number of mathematicians walk into a bar. The first mathematician says "I'd like a beer". The bartender replies "Well ordered! Who's next?".

MathsJam Shout is a monthly sheet of ideas for activities to do at a MathsJam night. It's created using suggestions from a different MathsJam each month, and if you'd like to submit suggestions for a month in the future, email **katie@mathsjam.com** for details.

MathsJam is a monthly opportunity for like-minded self-confessed maths enthusiasts to get together in a pub and share stuff they like. Puzzles, games, problems, or just anything they think is cool or interesting. Monthly MathsJam nights happen in over 70 locations around the world, on the second-to-last Tuesday of each month. To find your nearest MathsJam, visit the website at **www.mathsjam.com**.

Golden Ratio Triangles