

Dice Design Competition

Design a dice* or a set of dice. Submit a textual description or a link.

Prize: I will attempt to make a physical copy of the winner's design, and email the winner a picture before the next Big MathsJam. If the design requires materials that are illegal, unobtainable, expensive, dangerous, or disgusting, I may substitute different materials. If the design cannot be represented in a volume of 3-D euclidean space that would fit in a 64 cm^3 box, or is in any way a blatant troll, I may email an artistic representation of the design instead.

*I am American, so it hurt me to write that. I hope you're happy.

Mathematical Sculpture Competition

An advantage of MathsJam being online is that you're at home, and you have access to everything you usually have at home.

Make a mathematical sculpture from whatever you happen to have in your house. Lego, paper clips, spaghetti...anything goes!

Your entry should include a short description of your sculpture and a link to a photo of it.

The prize will be awarded to the sculpture I like the most, based on woolly, subjective and impossible-to-justify criteria.

Popping to the shops to buy something for the sole purpose of entering this competition is strictly forbidden. I am watching you.

Write an article or a regular feature for Chalkdust Magazine!

Length: Most articles in Chalkdust have between 500 and 2000 words, although we have been known to accept longer and shorter articles.

Difficulty: We suggest that articles should not be too difficult for an enthusiastic first year undergraduate to understand (but the starting level can be much lower than this).

Format: Our preferred format for article submissions is LaTeX or Word.

To submit your article share a link to it!

Prize: Our editors will work with you to improve your article for publication in Issue 15 of our magazine (out Spring 2022)

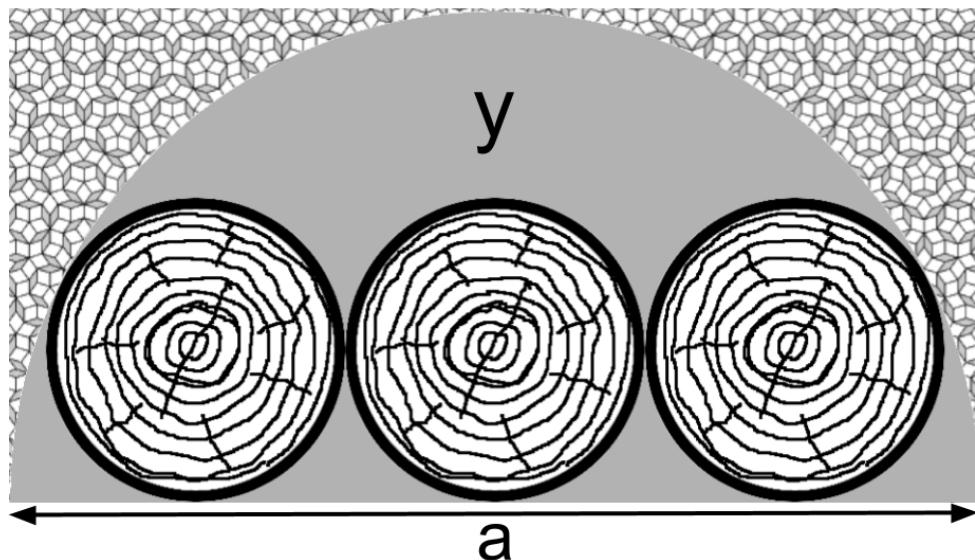
Yule Be Wondering

My 3 perfectly cylindrical Christmas logs of radius (r), lie perfectly snug against each other and to the sides of my perfectly semi-circular tiled fireplace of width (a).

Ah nice! A perfect Christmas except that it turns out that

$$a = 4r \left(1 + \frac{a}{y}\right)$$

which due to Health & Safety regulations means Santa won't be coming down my chimney. Do you know why?



Linked auctions competition

Think of an integer $x > 0$ and submit it as your entry to this competition.

You will take part in three sealed-bid auctions:

1. a first-price auction (highest bidder wins and pays their bid) where you bid x ;
2. a second-price auction (highest bidder wins and pays the second-highest bid) where you bid $\max(1000 - x, 0)$;
3. an all-pay auction (highest bidder wins, all bidders pay) where you bid $|500 - x|$.

The competition winner will be the person who minimises

$$\frac{\text{amount paid}}{\text{number of auctions won}}.$$

Ties decided by random-number selection.

MEAN GUESSING GAME (Round 3)

Your entry must be an **integer** between 0 and 100 inclusive.

The winner is the entry closest to **two thirds of the mean** of all entries.

Note

This competition has been run twice before. The mean of entries to 1 d.p. were:

Round 1 (2019): **24.3**

Round 2 (2020): **16.1**

Crowdfunder මුද්‍රාණය කළ විකල්පයක් ලෙස ඔබගේ

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ඔබගේ මුද්‍රාණය කළ පිටුව “first attempt at
crowdfunder” ලෙස ඔබගේ වෙබ් ස්ථර
ස්ටෝරිස් ස්ටෝරිස් තුළ ඔබගේ
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Crowdfunder මුද්‍රාණය කළ, ඔබගේ පිටුව
තවද ඔබගේ පිටුව ඔබගේ Crowdfunder
වෙබ්සයිට් වෙබ්සයිට් මත පිහිටා ඇත.

ඔබගේ පිටුව ඔබගේ මුද්‍රාණය කළ පිටුව,
ඔබගේ පිටුව මුද්‍රාණය කළ පිටුව: ඔබගේ
පිටුව ඔබගේ පිටුව?

ඔබගේ පිටුව ඔබගේ පිටුව ඔබගේ
වෙබ්සයිට් වෙබ්සයිට් Crowdfunder T-sites!

Here's a 2-player game: At the start, there is \$1 on a table between you and another player. One of you is randomly chosen to go first. On your turn you can:

- *bank*, splitting the money on the table 4:1 in your favour and ending the game, or
- *pass* the money to your opponent.

It will then be your opponent's go, and they have the same choices. Each time the money is passed, the amount gets multiplied by $1+U$, where U is uniformly random on $[0, 1]$ (so U is equally likely to be any number between 0 and 1).

If both players keep passing until the pot exceeds \$100 then the pot is split evenly. You will play this game against all other competition entrants. Whoever has the most money at the end will win.

I would bank once the pot exceeds \$... on my turn.