

Unique picture

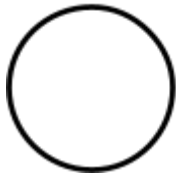
Your name: _____

An entry consists of a picture of one of the allowed shapes, containing a number.

Make as many entries as you wish on the other side of this form.

For each entry:

- Draw one of the below allowed shapes



a circle (1 side)



a heart (2 sides)



a triangle (3 sides)



a square (4 sides)



a pentagon (5 sides)

- Write an integer 0-9 inside your shape

Each entry scores a number of points equal to ten times the number of sides of the shape, plus the number inside the shape.

For example, a circle with a 3 inside = $10 \times (1 \text{ side}) + 3 = 13 \text{ points}$.

If any of your entries are identical to somebody else's entry AND you have made an equal amount or more entries than they have, you will be immediately disqualified.

You may repeat your own entries without disqualifying yourself.

Once all disqualifications have been made, those remaining will be awarded the total sum of the points of their entries. The highest scoring entrant(s) will win.

If there are no remaining participants, the person who set the competition will win.

Competition Competition Entry:

Meta Meta Competition

Scott Wilson

Instructions:

Find the best (for your definition of "best") way to arrange all the Competition Competition entries on the Competition Competition Table.

Sketch your entry below

Lukewarm Value Competition

Choose an integer X in the range 10 to 10^{10} inclusive. The winner is the largest X that is also strictly less than the product of the 4 smallest entries.

Moderate Interval Competition

Choose 2 integers X, Y in the range 10 to 10^{10} inclusive, with $Y > X$. The winner is the entry with the smallest value of $Y - X$ that entirely contains at least one competing entry interval X_c, Y_c such that $X_c < Y_c < Y$.

Cancelling Competition

Choose an integer X in the range -10^8 to 10^8 inclusive. The winner is the closest to the sum of all valid entries.

Stupidly unfashionable 2022 Competition

Enter a list of equations, numbered 0, 1, 2... to as high as you can get to (consecutive numbering please). The winner is the entry with the most valid equations, that does not get disqualified (for having an invalid equation, including skipping a number in the sequence or leaving a blank equation). A valid equation numbered i must be of the form either

$2022 + i = \text{expression}$

OR $2022 - i = \text{expression}$.

The expression on the right-hand side must contain each digit from 0 to 9 exactly once and any number of brackets and the operators: $!, +, x, -, ^$ (exponent), $/$ (division) and $\sqrt{\quad}$ (square root only). The equation must be correct.

Please be legible. If we cannot understand your equation, then you risk being disqualified!

Judge's decision is final.

Here is an invalid example...

$$0. 2022 + 0 = 3 \times 1089 - \frac{7512}{6} + 4$$

It is invalid because the right-hand side comes to 2019 and contains 2 instances of the digit 1.

Securely attach extra sheets of paper if necessary

Confetti Confusion

Guess how many sprinkles are in this cupcake.

Closest guess to the correct number wins the cupcake. If multiple people make the correct or closest guess the winner will be the person who guessed first.

Name: _____

Date: _____

Time: _____

Guess: _____

Instructions

- Solve the puzzles below (in base 10) by any means
- Convert the answers to base 3
- Write the answers in the boxes to the right, including leading zeroes.
- Colour the squares containing a 1 red; containing a 2 blue; leave 0 unshaded.
- When finished, place your completed entry in the box.

Winner will be selected randomly from correct entries.

Name: _____

Puzzles

1. The smallest cube that is the sum of three positive cubes
2. Find the smallest sum for a set of even numbers that contains every digit (0-9) once. Then multiply it by two.
3. The product of a number twice the sum of its digits, and 67
4. Sum the squares of the odd numbers from 1 to 17
5. How many odd-numbered days are in the 2022 calendar?
6. Number of primes less than 1000; also a permutation of the digits to the answer for question 5.
7. The smallest number with 20 divisors
8. The largest number NOT expressible as the sum of two composite numbers
9. The smallest (multi-digit) number that gives a perfect square when added to its reverse.
10. Divisible by every number 1-10 (except 7). This number has the same amount of letters in its Roman representation when doubled, tripled, quadrupled, quintupled, sextupled or septupled.

Puzzle Vision Competition

	729	243	81	27	9	3	1
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Maths Pun Movie Title Competition

Think of a movie title and make it maths! Funniest wins*

Your name:

Your best movie title maths pun:

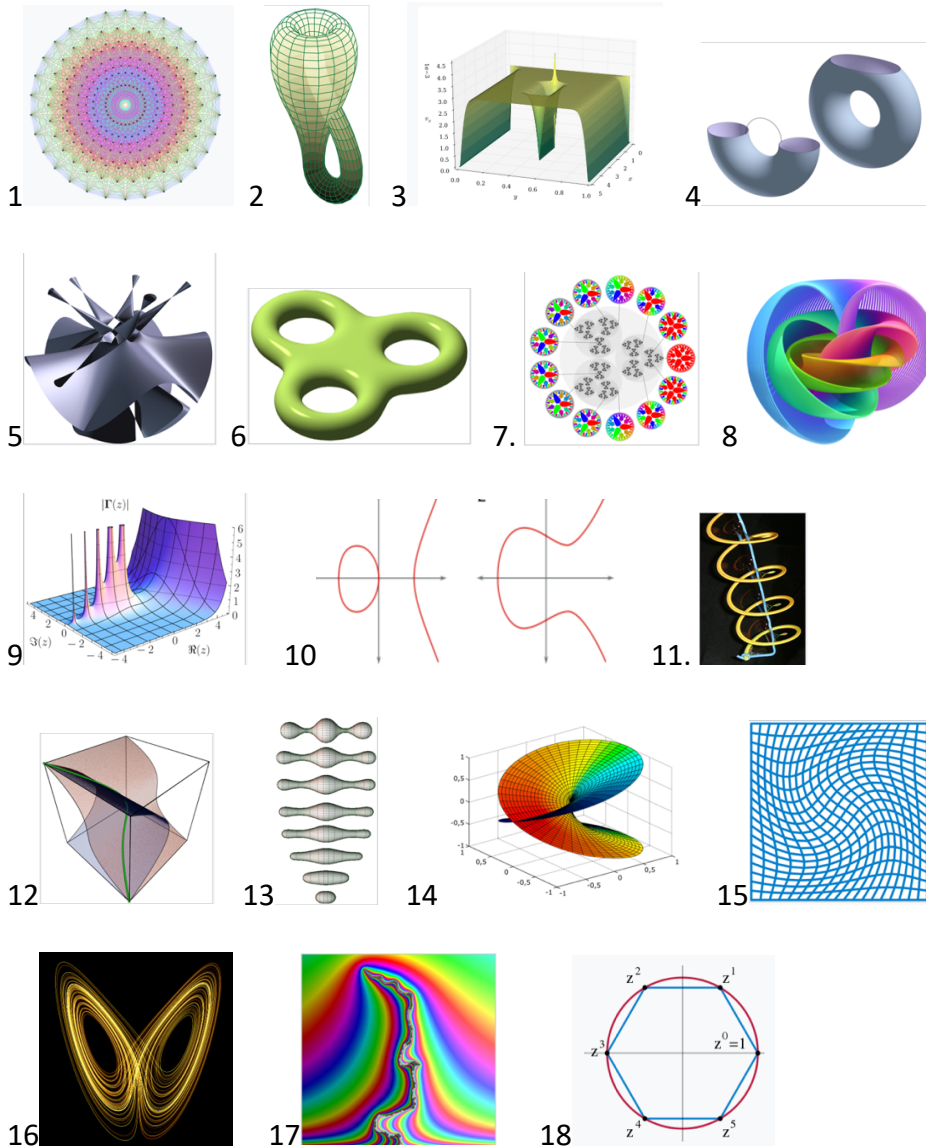
Film's actual name:

Bonus to convince me! write a very short synopsis of the movie with your title (it doesn't have to be true to the original film):



*Objectivity of the judge's sense of humour not guaranteed

Match the Image with the Mathematical Caption. All come from work by Mathematicians who won the Fields Medal.
 No Googling allowed – just make a reasonable guess



Number	Name
	A. Riemann surface for the function $f(z) = \sqrt{z}$ (z is complex)
	B. The gamma function is metamorphic in the whole complex plane
	C. A helicoid minimal surface formed by a soap bubble
	D. Navier-Stokes differential equations simulating air flow around an obstruction
	E. The twisted cubic is a projective algebraic variety
	F. The Klein bottle immersed in 3-D space.
	G. The Morse Theory of the height function on a torus can describe its homotopy type
	H. The image of a rectangular grid on a square under a diffeomorphism from the square onto itself.
	I. The Togliatti Surface is an algebraic surface of degree five
	J. A genus of three handlebody
	K. A Lie (pronounce Lee) group is a group that is also a differentiable manifold
	L. The Burnside Problem asks whether a finitely generated group & every element is of finite order, must necessarily be a finite group
	M. Several stages of Ricci flow on a 2D manifold
	N. Schramm-Loewner evolution on the upper half plane with hue indicating $\log(Im(g_t(z)))$
	O. The graphs of the elliptical curves: $y^2 = x^3 - x$ and $y^2 = x^3 - x + 1$
	P. The 3-adic integers, with selected corresponding characters on their Pontryagin dual group
	Q. The Lorenz attractor arises in the study of the Lorenz oscillator
	R. The Hopf fibration maps the 3-sphere onto the 2-sphere

Hashi

Find a solution to the Hashi puzzle on the back of this page

The Basic Rules of Hashi

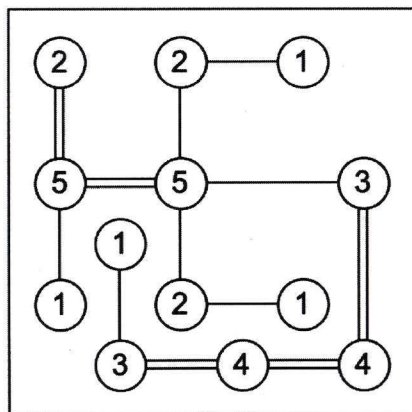
The goal of the puzzle is to connect all vertices together into a single connected graph.

The number of edges that connect to a vertex must equal the number written on the vertex.

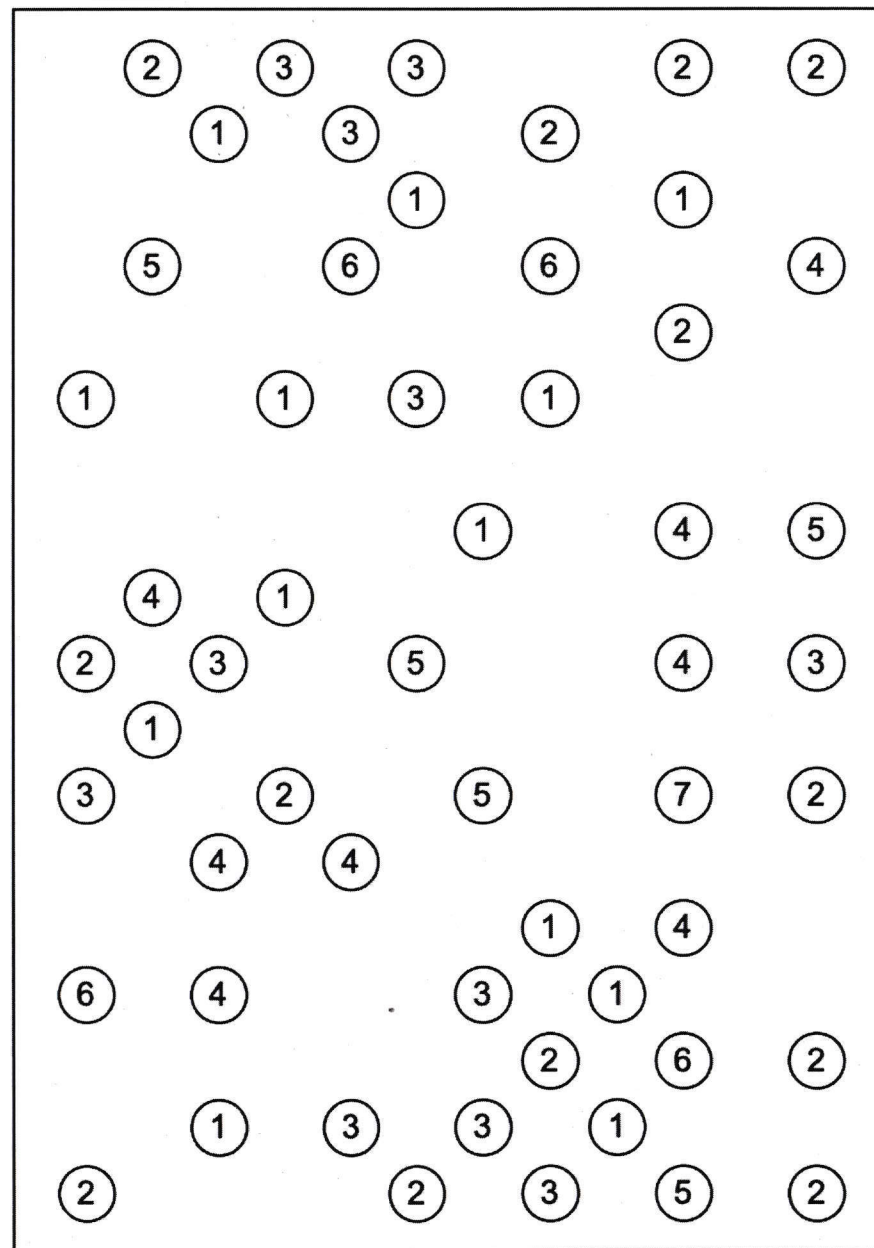
The maximum number of edges between two vertices is two.

Edges must be vertical or horizontal straight lines and cannot cross over one another.

Example of a solved Hashi puzzle



Name : _____



NZ APRICOTS FRUIT PRESERVE

Name:

pick one



On the back of this sheet -
write a HAIKU about a **Female Mathematician**.
She can be famous or not.
Include her name and achievements

Traditional Haiku Structure

The structure of a traditional haiku is always the same,
including the following features:

1. There are only three lines, totalling 17 syllables.
2. The first line is 5 syllables.
3. The second line is 7 syllables.
4. The third line is 5 syllables like the first.
5. Punctuation and capitalization are up to the poet, and need not follow the rigid rules used in structuring sentences.
6. A haiku does not have to rhyme, in fact usually it does not rhyme at all.
7. It can include the repetition of words or sounds

Don't forget to add your own name at the end

Pick the Median Number

Write your name and any **one** number as your answer on this form, the entry with the median number as their answer wins.

Name:

Answer:

Guess the Total N. of entries

Guess a number. This number is the total number of entries by you in the competition. Closest to $(\text{total number of entries})/100$, wins. Eg. If you guess 2, that is 2 entries to this competition by you, and if there were eg. 201 in total, you are 0.01 off the correct guess.

The number you guess is also the number of entries you are entering - this overrides the 'one entry per sheet submitted' guideline.

One one entry sheet permitted per person.

Your Name:

Your ^{NUMBER} Entry: