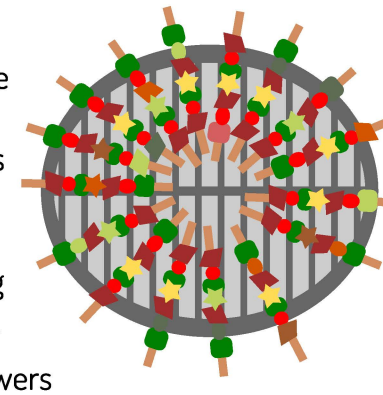
MathsJam Shout

July 2023
Summer Camping Holiday

Play
Skewer Nim

A number of skewers have been cooking on the barbecue, and they're ready to eat - here are some Nim variations you could use to take them off.

- Take it in turns to take one, two or three skewers
- Take it in turns to take one, two or three **adjacent** skewers
- Take it in turns to take skewers, each time taking **up to twice as many** as the previous person took.



In each case, how can a player ensure they get the last one? How many skewers would you want there to be initially to guarantee a win going first?

Investigate
The Tent Map

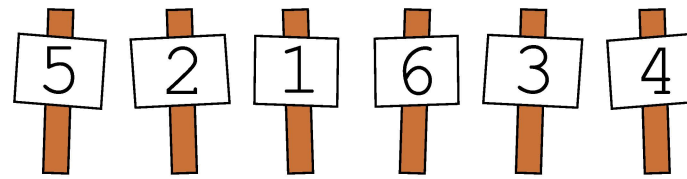
This map is defined as follows:

$$T_a(x) = \begin{cases} ax & x < \frac{1}{2} \\ a(1-x) & x \geq \frac{1}{2} \end{cases}$$

Use the handout to produce cobweb plots for various intial values and investigate the map.

Handout: bit.ly/tentmap-cobweb

GGB version: bit.ly/tentmap-cobweb-GGB

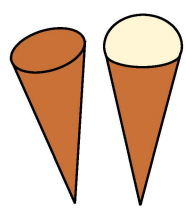


Puzzle
Pitch Switch

Six tent pitches on the campsite have been assigned the numbers 1-6 in a random order (one possible ordering is shown above).

What is the probability that for each pair of neighbouring tents, one of their pitch numbers is a multiple of the other?

Puzzle
Cones

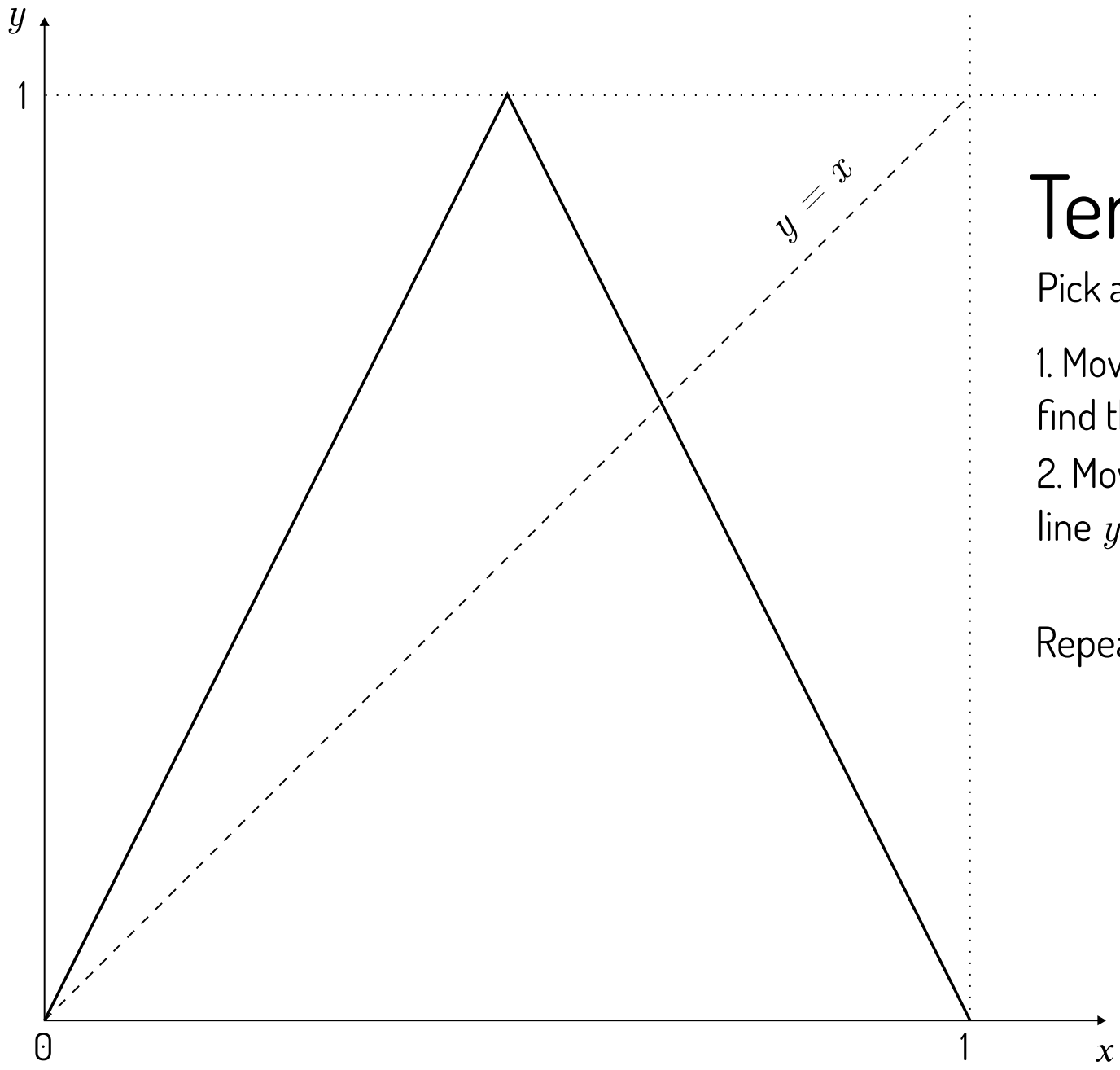


The ice cream van that goes round the campsite sells two sizes of cone. The ratio of their heights is 1:3 and the ratio of their diameters is 3:5. What is the ratio of their volumes?

How does this change if you add a hemisphere of ice cream on top?

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**.



Tent Map for a=2

Pick a value for x, and start at $(x, 0)$.

1. Move vertically to the solid line to find the value of $T_2(x)$
2. Move horizontally to the dashed line $y = x$ to get a new value for x

Repeat steps 1 & 2 to iterate.