



A pizza can be cut into **67** pieces using 11 straight cuts

### News

I read recently that scientists have discovered that bees are actually quite good at maths.<sup>1</sup> They are able to count, as well as being able to do simple additions and subtractions. They even understand the idea of zero, which kind of makes them better than the Romans were at maths because, as you know, there is no Roman numeral for zero.



This made me wonder whether any other animals could do maths, so I googled “Which animals can do maths?”<sup>2</sup> and apparently lots of them can!

Krista Macpherson, a professor at Canada's University of Western Ontario, proved that not only can dogs count, but that they can also improve their mathematical skills if they practise!

Robins can also count. Scientists in New Zealand discovered that “When robins received extra worms, they seemed eager and excited. When they found less worms than expected, they went into a rage.”<sup>345</sup>

It turns out that there are loads of animals that can count, including lions, frogs, and certain types of fish.

The animals who are the best at maths though are monkeys. In an experiment carried out in 2007, a group of monkeys performed almost as well as a group of college students!<sup>6</sup>

1. I mean, it's all relative... you know...

<https://www.independent.co.uk/news/science/bees-maths-insects-brain-addition-subtraction-numbers-experiment-research-a8765921.html>

2. This is what the internet was invented for. 3. Clearly this should be ‘fewer worms’, not ‘less worms’.

4. Unfortunately, I couldn't find a picture of a raging robin on the internet. You'll have to imagine one - or if you'd like to draw a raging robin, send me the picture and I'll put it in the next newsletter.

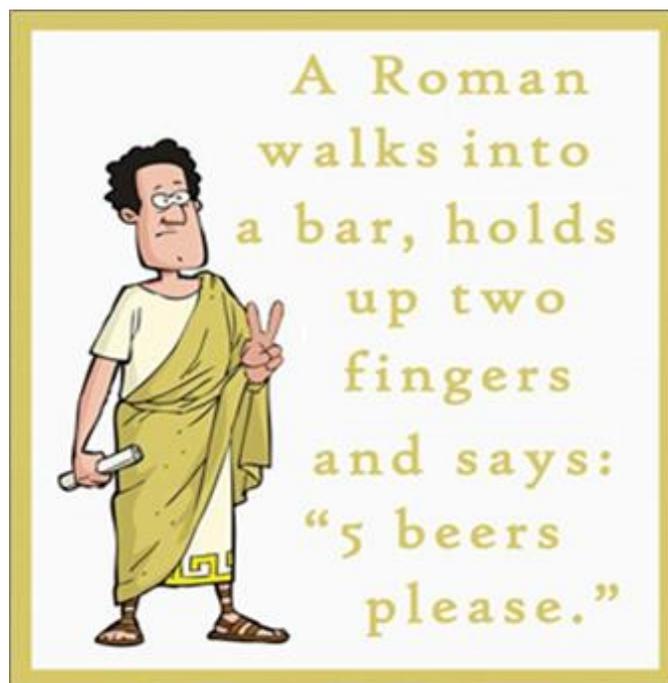
5. These are footnotes 3, 4 and 5, not footnote 34, or 345.

### Puzzle

As you know, for hand sanitiser to be effective, it needs to have an alcohol content of at least 60%. If I have a 300 ml bottle with 30% alcohol, and a 300 ml bottle with 70% alcohol, and I want to fill a 200 ml glass beaker by mixing the two, so that the resulting mixture will have a 60% alcohol content, how much from each bottle should I use?



### Joke



## Brilliant Puzzles

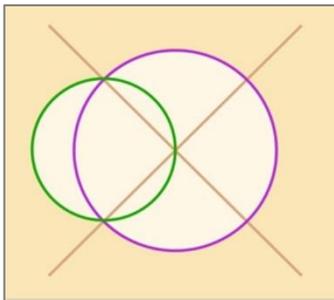
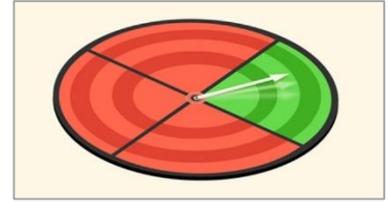
Here are some puzzles from the excellent [Brilliant.org](https://brilliant.org) website.

It's a subscription website, but they sometimes give some of their puzzles away for free. Here are some of the free ones...

Suppose you play a game where you win 25% of the time.

Which is more likely?

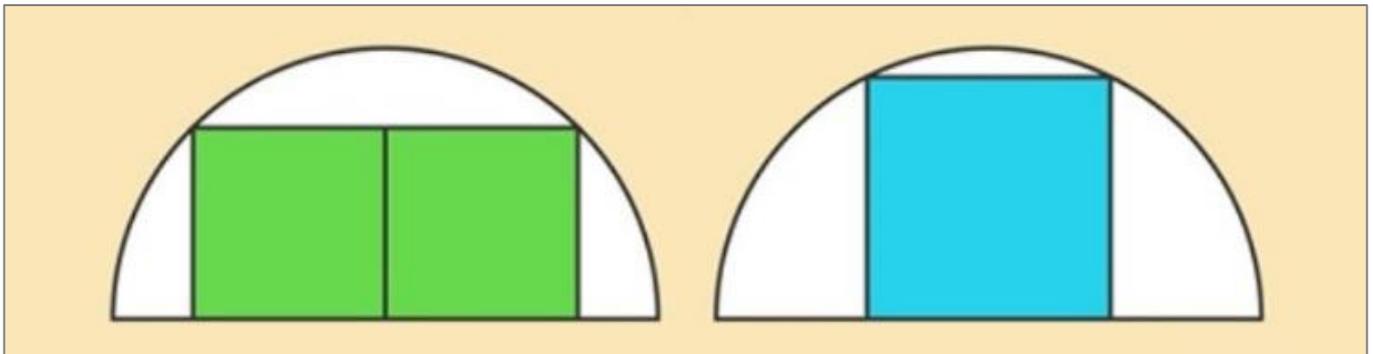
- A. You lose the first 8 games
- B. You lose the first 4 games, then win the 5th



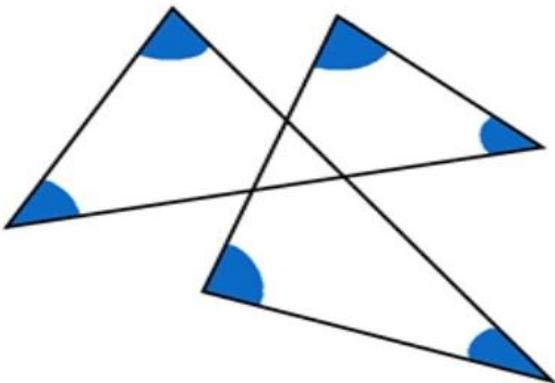
The brown lines are perpendicular and meet at the larger (purple) circle's centre.

What fraction of the purple circle's area is the green circle's area?

Which has a greater area? A square inscribed in a semi-circle, or two adjacent squares inscribed in the same semi-circle?



What is the sum of the 6 blue angles?



## House Points

If you have read this far, then thanks for being a maths newsletter reader. If you would like three house points, as a thank you for reading the maths newsletter, just email me your **name**, **form** and **house** and I'll pass this on to your head of year who will give you three house points.<sup>7</sup> Just put the words '**Three House Points**' in the title of your email. The only condition on this is that I need to have the email by the end of next Wednesday. 😊

6. Although I do wonder whether this says more about the college students than it does about the monkeys...

7. This is not a joke.