King Edward VI Camp Hill School for Girls

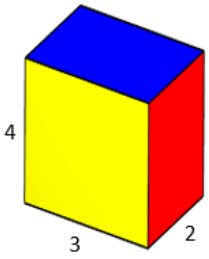
Maths Department Newsletter

22nd March 2021

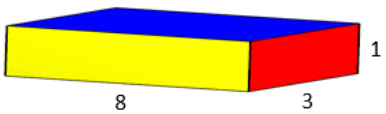
Mathematically, there are 85 ways to tie a tie

News

You may have noticed that towards the end of last year, the shape of cheese changed. According to Tesco, it was changing from the 'traditional square block shape' to an 'oblong packaging'.[1] The reason for this change was interesting. Tesco said that the new shape would save 260 tonnes of plastic every year. They said, "By changing the pack shape and also removing the re-sealable zip we will be able to reduce plastic packaging on our brand hard cheeses by up to 41% against the former product, depending on the size of the block." Now, clearly there is some maths going on here. What they are saying is that it's possible to have two different cuboids with the same volume but with different surface areas. If you don't believe that, here is an example.



4 × 3 × 2 = 24 and 1 × 3 × 8 = 24
but 2 × (12 + 8 + 6) = 52
and 2 × (8 + 3 + 24) = 70



This leads to some obvious mathematical questions. For example: for a cuboid with a volume of 24 cm^3, what is the minimum surface area it could have?

More About the Cheese

I meant to write in the maths newsletter about this last year, but then lots of other things happened[2], and I'd almost forgot about it when Dr Dewes reminded me about it a few weeks ago. There are lots of maths problems that say basically "if I keep this one thing fixed, what is the maximum or minimum that I can make this other thing?". If you would like to think about some of them, you could try these:

1. If the area of a flat 2-dimensional shape is 100 cm^2, what are the maximum and minimum values its perimeter could be?

Alternatively

2. If the perimeter of a flat 2-dimensional shape is 100 cm, what are the maximum and minimum values its area could be?

Or what about

3. If the product of two numbers is 100, what are the maximum and minimum values that their sum could be?

It's not only Tesco that changed the shape of their cheese. Pilgrims Choice also did.

This leads to the equally puzzling question, when did pilgrims become such experts on cheese? If I'd wanted cheese advice, I'd never have thought to ask a pilgrim.[3]

1. It was never actually 'square' to begin with, but seeing as I can't think of a better way to describe it either, I'll just use Tesco's own words, but put them in quotes so you know that the mathematical inaccuracies are theirs, not mine. You can read the whole article by clicking on the link below:
https://www.thegrocer.co.uk/plastic/tesco-claims-ground-breaking-plastic-reduction-on-cheese-packaging/650462.article
2. Like Christmas, The Queen's Gambit, the mountains thing, the 50th anniversary of decimalisation etc…
3. Would you have? If so, why?

Memorising Pi

Some people like to see how many digits of pi they can memorise. Because it won't help them in their day to day life though, some people think that this is a pointless waste of time. Other people think it's a fun way to see how good you can get at remembering things, and no more useless than many of the other things we do, like watching TV and eating sweets.[4] Here at maths newsletter headquarters[5], we can get about as far as 3.1415926535897932 3846264338327950288419716939937510582… and then we get stuck… but maybe you could do better. If you would like to try, why not type 'calculator' into Google, then click on the pi button to activate the training mode. Clicking on the pi symbol will then start the game!

Click here!

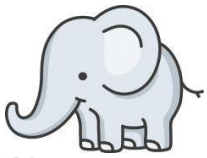
Please let us know if you beat our record!

Did You Know?

The current world record for remembering digits of pi is held by Akira Haraguchi, who recited the first 100,000 or so digits of pi from memory in 2006. It took him 16 hours and 30 minutes to do this!

Maths Competition

As you may have read in the email sent by Mr Bettison, it's that time of year again when we enter the maths challenge run by the University of Southampton. There is a junior one, for years 7 and 8, and a senior one, for years 9 and 10. Here is the first question from the junior one:



The Elephants in the Zoo

A zoo has an equal number of African elephants and Asian elephants. The African elephants cost £11 per day to feed and the Asian elephants cost £9 per day to feed. The total daily bill for feeding all of the zoo's elephants is £1000.

How many elephants does the zoo have?

There are seven questions in total on each of the papers. If you think you would like to enter the competition[6], answer all seven questions and hand in your full worked solutions to Mr Bettison no later than Tuesday 20th April. Good luck!

Joke

Here's a cheese joke[7], chosen by Dr Dewes.

4. Unlike eating sweets, nobody has ever become ill from memorising too many digits of pi.
5. which definitely is a real place
6. Our school often does very well in this competition. We have even won it a few times.
7. I'm not going to say 'cheesy joke' because that in itself would be a cheesy joke, and this newsletter is not about recursion.