

Puzzles w/c 28/10.

I like puzzles, and hopefully other people do too, so I'm going to see if people fancy the idea of a mini team puzzle every other week. We'll see how it goes! The best solution to **each one** wins a chocolate bar/similarly priced alternative snack. I accept solutions in all legible forms (i.e. you don't have to LaTeX it). As an extra incentive whoever gives the best answer to the harder puzzle will win a slide rule. If you're not based in London I will find some way to get you your prize.

On the puzzles

The plan is to have a variety of types of puzzle. I used to be a maths teacher, so this week is puzzles I've given to A-level students in the past. Almost all of us have been A-level maths students in the past, so these should be easy right? You're welcome to look things up, but all of the steps in your answer should be things in the A-level syllabus.

As traditional, answers with no working score zero.

Please send your answers by 17:00 on 08/11 to peter.brohan@communities.gov.uk.

Easier

This was marked as "2/4" in my big book of maths puzzles for A-Level students. I think it's a neat classic geometry puzzle

An infinitely large floor is tiled with regular hexagonal tiles of side length L . Different colours of tiles are used so that no two tiles of the same colour touch. A hoop of diameter d (but negligible width) is thrown onto the tiles. **What is the chance of the hoop enclosing more than one colour.**

Professor Povey's Perplexing Problems – Thomas Povey

Harder

I still don't have a good solution to this. I do have the answer, but I am not happy with my method. I'd be interested to see what better solutions people come up with.

The four rods AB , BC , CD and DE are of equal length and are hinged at B , C and D . They lie on a flat surface in such a way that A touches CD and E touches AB .

Given that triangle ADE is isosceles, **find angle \widehat{ADE}**

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