Student Problems

Students up to the age of 19 are invited to send solutions to either or both of the following problems to Beth Woollacott, WAV.1.05, Wavy Top Building, Loughborough University, Loughborough LE11 3TU.

Two prizes will be awarded − a first prize of £25, and a second prize of £20 − to the senders of the most impressive solutions for either problem. It is not necessary to submit solutions to both. Entries should arrive by 20th May 2022 and solutions will be published in the July 2022 edition.

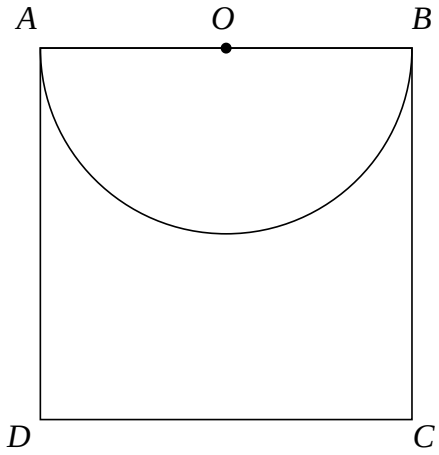
The Mathematical Association and the *Gazette* comply fully with the provisions of the 2018 GDPR legislation. Submissions **must** be accompanied by the SPC permission form which is available on the MA website

https://www.m-a.org.uk/the-mathematical-gazette

Note that if permission is not given, a pupil ***may still participate and will be eligible for a prize in the same way as others****.*

Problem 2022.1 **(Geoffrey Strickland)**

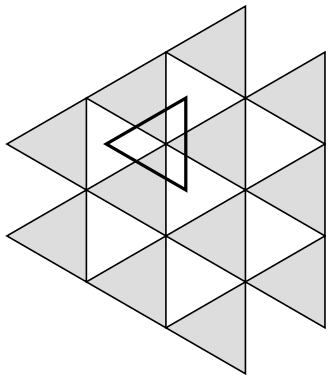
Given a square *ABCD* with a semi-circle, diameter *AB* and centre *O*, inscribed inside it, show how to construct the golden points on each side of the square using only a straight edge and a pencil.



Golden points are points which divide a side internally in the Golden Ratio. There are thus two such points on each side.

Problem 2022.2 **(Paul Stephenson)**

A regular triangular tiling is two-coloured so that adjacent triangles have opposite colours. The grey triangles point left. A free triangle of the same size, also pointing left, may be translated anywhere on the tiling.



What is the smallest fraction of the free triangle which can be grey?