Student Problems

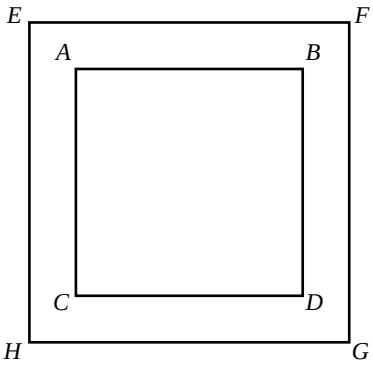
Students up to the age of 19 are invited to send solutions to either or both of the following problems to Tuya Sa, SCH.1.17, Schofield Building, Loughborough University, Loughborough, LE11 3TU. Two prizes will be awarded − a first prize of £25, and a second prize of £20 − to the senders of the most impressive s for either problem. It is not necessary to submit s to both. s should arrive by 20th January 2024 and will be published in the March 2024 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 Mathematical Association 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 2023.5 (**Geoffrey Strickland**)



ABCD is a square with centre *O*. *EFGH* is an enlargement of *ABCD* with centre *O*, such that its area is twice that of *ABCD*.

Show how the border between the two squares may be dissected into no more than ten pieces which will fit in to *ABCD*.

Problem 2023.6 (**Paul Stephenson**)

The n th triangle number, $T_n = \frac{1}{2}n(n+1)$ for $n \geqslant 1$. Determine which triangle numbers cannot be represented as the difference of two squares.