# 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, 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 solutions for either problem. It is not necessary to submit solutions to both. Entries should arrive by 20th September 2022 and solutions will be published in the November 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 2022.3*** **(Mark Emson)**

Evaluate

$$\int_0^\infty \frac{1}{1 + x^3}\, dx.$$

***Problem 2022.4*** **(Geoffrey Strickland)**

A “nearly isosceles” right-angled triangle with integer side-lengths is defined as one in which the two sides adjacent to the right angle differ in length by just 1 unit. A triangle with side lengths 20, 21 and 29 is an example. Find, with proof, a method for generating a sequence of such triangles.