# Student Problems

Students up to the age of 19 are invited to send solutions to either or both of the following problems to Stan Dolan, 126A Harpenden Road, St Albans, Herts. AL3 6BZ.

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, therefore, not necessary to submit solutions to both. Solutions should arrive by January 20th 2018. Please give your School year, the name and address of your School or College, and the name of a teacher through whom the award will be made. Please print your own name clearly! The names of all successful solvers will be published in the March 2018 edition.

Problem 2017.5 (Paul Stephenson)
The diagram shows three shaded shapes fitting snugly between two lines.
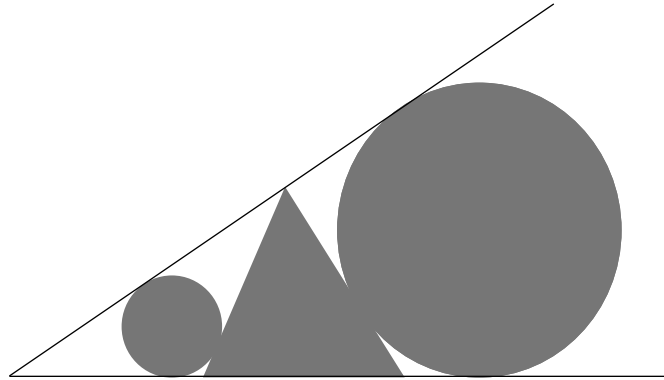
The perimeters of the small circle, triangle and large circle are 1, 2 and 3 units, respectively.

How far apart are the centres of the two circles?

Problem 2017.6 (Geoff Strickland)
If a and b are positive real numbers with $a + b = 1$, then prove that

$$\left(a + \frac{1}{b}\right)^2 + \left(b + \frac{1}{a}\right)^2 \geqslant \frac{25}{2}.$$