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 September 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 November 2018 edition.

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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***.

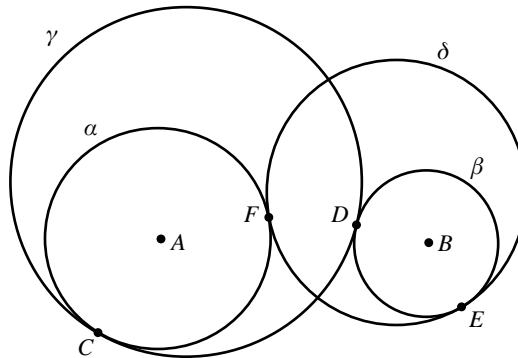### Problem 2018.3 (Geoff Strickland)

Two circles, α and β, have centres at A and B respectively.

Circle γ contains circle α and touches it at C. Circle γ also touches circle β (externally) at D.

Circle δ contains circle β and touches it at E. Circle δ also touches circle α (externally) at F.

Prove that AB, CD and EF are concurrent.

Problem 2018.4 (Nick Lord)

For positive real numbers x and y find the minimum value of

$$\frac{(1 + x)(x + y)(y + 8)}{xy}.$$