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, 20 Rectory Close, Sutton Bonington, Loughborough, Nottinghamshire, LE12 5PJ.

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 2021 and solutions will be published in the November 2021 edition.

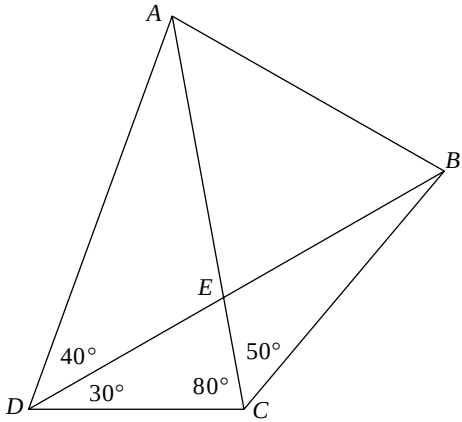
The Mathematical Association and the *Gazette* comply fully with the provisions of the 2018 GDPR legislation. Submissions **must** be accompanied by the SPC permission form which is available on the MA website

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 2021.3 (**Geoffrey Strickland**)

The diagram shows a quadrilateral *ABCD* with diagonals *AC*, *BD* intersecting at *E*. $\angle ADB = 40°$, $\angle ACB = 50°$, $\angle ACD = 80°$ and $\angle BDC = 30°$.



Find the angles of triangle *AEB*.

Problem 2021.4 (**Paul Stephenson**)

Let n and k be integers greater than 1 with k a power of 2. Prove that $n^{2k} + n^k + 1$ has at least $2k$ different factors.

Note from the Editor

See *www.m-a.org.uk/the-mathematical-gazette* for the SPC questions.