Correspondence

DEAR EDITOR,

Most scientific calculators have a button for selecting the angle units to be radians, degrees or *grads* when using trigonometrical functions. Who uses *grads*?

Yours sincerely,

A. ROBERT PARGETER

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DEAR EDITOR,

In a recent note (77.15) I stated a result that the Fermat point of a tetrahedron has an equianqular property. I would like to make clear that in the proof I *assumed* the existence of such a point, and that for some tetrahedra this may not be a valid assumption to make. Nevertheless, for tetrahedra with a degree of symmetry, say with one equilateral triangular face and with three other identical isosceles triangular faces, the result is certainly true.

Yours sincerely,

PAUL GLAISTER

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Editor's note

I received Paul's letter before note 79.21.

DEAR EDITOR,

Looking through some back numbers of the 'Gazette' for something else, I came across a note (77.5) by R. H. Macmillan in the March 1993 issue, entitled 'Area of a triangle'. Since as far as I can see this did not occasion any response, I am emboldened to stick my neck out — I do so with some trepidation, given that I am very much an amateur amidst the professionals — and offer the following comments.

I was taught what is effectively this formula when I was at school some 50 years ago, but it was expressed in a different form. Specifically, the area of a triangle with coordinates (x_1, y_1), (x_2, y_2) and (x_3, y_3) is given by:

$$0.5 \times \begin{vmatrix} 1 & 1 & 1 \\ x_1 & x_2 & x_3 \\ y_1 & y_2 & y_3 \end{vmatrix}.$$

From this it follows that if one regards one of the points — say (x_1, y_1) — as a variable (x, y) then the necessary and sufficient condition for (x, y) to lie on the line joining (x_2, y_2) and (x_3, y_3) (i.e. the equation of the line through them) is that the area of the triangle is zero, i.e.

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