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

10, Turnpike, Sampford Peverell, Tiverton EX16 7BN

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

Department of Mathematics, PO Box 220, University of Reading, RG6 2AX

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.