be required to reproduce the proof, but only to learn the result, as a formula, and then how to apply it.

It has been suggested that the formula for the solution of the equation

$$x^2 + 2px + q = 0$$

is easier than that of the more general equation. This is true, but in application an extra step is needed, the division by the coefficient of x^2, and an extra choice is given of expressing the other coefficients in fractions or decimals. This opens the door to other mistakes, such as writing $\frac{2}{3}$ as 0·6 or 0·66. Hence I advocate the use of the more general formula.

May I summarise with the suggestion that quadratic equations should be introduced as an application of factorising, and as an illustration of one use of the graph of a quadratic function. The main work on quadratic equations should be with the general formula, preceded by a short explanatory treatment of completing the square.

Harrow School K.S.S.

CORRESPONDENCE

To the Editor of the *Mathematical Gazette*

DEAR SIR,—There are two matters of historical interest in the A.M.A. book, *The Teaching of Mathematics*, to which I should like to draw attention.

(i) On p. 93 the book implies that to the 1923 M.A. *Report on the Teaching of Geometry* was due the idea of dividing the subject into stages and the modern method of treating the early stages. The book does not point out that the first authoritative statement of these ideas was in the Board of Education Circular No. 711 published in March 1909. (The stages were not quite the same as those suggested in the 1923 report.)

Circular No. 711 suggested that, in all but the last stages the theorems connected with angles at a point, the angles made by a transversal cutting parallel lines, and the congruence theorems should be taken as axioms (or postulates). It gave an admirable description of how those theorems should be led up to.

This laid the foundations for the modern views on the teaching of geometry. It is now well known that Circular No. 711 was mainly, if not entirely, due to W. C. Fletcher, though it was signed by a secretary of the Board of Education.

The failure to mention Circular No. 711 in the A.M.A. book is probably due to the fact that no member of the committee was old enough even to have been at school in 1909.

(ii) The other matter is concerned with the teaching of Elementary Calculus. The book suggests that Calculus was only taught to a few able pupils before the publication in 1944 of the Jeffery report; but the Oxford and Cambridge Joint Examination Board had a paper on Coordinate Geometry and Elementary Calculus for additional mathematics in its School Certificate Examination as early as 1921, though credit in additional mathematics could be obtained without taking that paper. Other examining bodies probably had papers on Elementary Calculus about the same date.

The book speaks of introducing Elementary Calculus " to fifth form pupils ", but before 1913 some schools were already teaching the subject to pupils below the fifth form.

Yours, etc., A. W. SIDDONS

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