Our collective view is that so much of the so-called new mathematics is so good that its isolation is tragic. We look forward to the return of the pendulum, when the new work takes its rightful place, completely merged with the main body of Traditional mathematics.

Yours sincerely,
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A SET AMBIGUITY 2

To the Editor, *The Mathematical Gazette*

Sir,

I was interested to read the letter by A. R. Pargeter entitled "A Set Ambiguity" in the October 1970 issue of the *Gazette*; for the point he raises is one which has also occurred to me and, I am sure, to many others.

I see no objection to saying that $\{0, 1\}$ is the solution set of both equations $x^2(x - 1) = 0$ and $x(x - 1)^2 = 0$. This expresses the fact that the polynomials with linear factorisations $x^2(x - 1)$ and $x(x - 1)^2$ have the same set of linear divisors, namely $\{x, x - 1\}$. This is analogous to the fact that the natural numbers 12 and 18, which have prime factorisations $2^2 \times 3$ and 2×3^2 respectively, have the same set $\{2, 3\}$ of prime divisors.

The key idea in solving an equation is to find those replacements for x which convert the equation into a true statement; and in this context to use language like 'the solution of the equation $x^2(x - 1) = 0$ is $x = 0, 0,$ or 1' is unnatural. The habit of writing the root 0 twice would appear to be associated with the practice of stating the Fundamental Theorem of Algebra in the following way:—

In the field of complex numbers an equation $P(x) = 0$, where $P(x)$ is a polynomial of degree n, has n roots.

I prefer to state this theorem in the following way:—

In the field of complex numbers a polynomial of degree n can be written as a product of n linear factors.

As I see it, solving an equation in the field of complex numbers is concerned with identifying the distinct linear divisors of a polynomial, without specifying the powers which these divisors have in the linear factorisation of the polynomial.

If a polynomial $P(x)$ has linear divisor $x - \alpha$ occurring to the power k in the linear factorisation of $P(x)$, then the polynomial is said to have a root α of multiplicity k. If $k > 1$, then α is said to be a repeated root of the polynomial. This is standard terminology; but it does not compel us, in case $k > 1$, to write down α k times when we are writing down the solution of the equation $P(x) = 0$.

Yours sincerely,
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