

### References

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## Correspondence

### Sense of direction?

DEAR SIR,

In the October 1974 issue your correspondent E. Holland takes me up on the question whether “direction” includes sense, and contends that it necessarily does so.

This must be a matter of definition, and in general authors define the word to suit themselves. In the last 50 years it has become the mode to treat direction as including sense, which is I think a pity. These are independent properties and are logically treated separately. For a displacement of 10 m vertically downward, 10 m is the *magnitude*, vertically is the *direction*, and downward is the *sense*.

One important reason for regarding direction and sense as distinct is for consistency with related conventions of trigonometry and analytical geometry. With cartesian co-ordinates, direction is indicated by gradient, without sense indication. “A radius vector with gradient 1” is ambiguous as to sense, as it could equally well be at angular displacements of  $45^\circ$  or  $225^\circ$  from the positive  $x$ -axis.

A physical analogy is with single-loop direction-finding, where the fundamental measurement has a reciprocal ambiguity, and sense is determined as a separate operation by cutting in an auxiliary sense aerial.

Yours faithfully,

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## Reviews

**Mathematical gems**, by Ross Honsberger. Pp. xi, 176. 1974. SBN 0 88385 301 9 (Mathematical Association of America)

This is Number One of *The Dolciani mathematical expositions*, sponsored through a fund established by Professor Mary P. Dolciani, of Hunter College of the City University of New York. The books are to be selected “both for clear, informed style and for stimulating