Help!

DEAR EDITOR,

Can anyone give me a non-exhausting method of finding the digits immediately to the left and to the right of the decimal point in

$$(\sqrt{2} + \sqrt{3})^{1980}?$$

My first idea of a product of the 4th, 8th, 16th, 32nd, 128th, 256th, 512th and 1024th terms has left me exhausted after $(\sqrt{2} + \sqrt{3})^{32}$.

Yours sincerely,
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Editor's note: if I receive an interesting answer from a reader I will publish it.

Reviews

Mathsworks, by Michael Holt and Andrew Rothery, 1980 (Longman)
  Books one and two. Pp 128, 96. £1·95 each. ISBN 0-582-22282-6/83-4
  Tryouts one and two. Pp 62, 46. 80p, 75p. ISBN 0-582-22284-2/85-0
  Teachers' books one and two. Pp 91, 71. £3·95, £3·45. ISBN 0-582-22288-5/89-3

Mathsworks is a two year course for use in fourth and fifth years of secondary schools. It places a strong emphasis on application and uses of mathematics while containing more academic material than many vocational courses. Arithmetic is the main theme, together with topics such as graphs, probability—including simulation—and simple linear programming. The material has been carefully graded for easy reading and is displayed in a form which is clear, lively and extensively illustrated. These books will be most useful for pupils who are following a Mode 3 restricted grade C.S.E. course. They will also be good for pupils who may not be following an examination course.

The material is pitched at such a level that the student will be able to grow in confidence. The Tryouts books are particularly helpful as they provide additional work and they set out much of the material in tabular form, so preventing the confusion of layout which can occur when pupils lack the ability to order their written material in a meaningful way. The complete set of answers are provided in the teachers books, which means that the teacher is released from the burden of working out all the solutions himself.

I am certain that these books will provide a welcome lifeline for many teachers of mathematics to fourth and fifth year students, and especially to those teachers who are non-specialist and who have been directed to fill the gaps in the timetable. The books will motivate the pupils who will be able to work in an individual way and at their own pace. The authors are to be congratulated for producing mathematics which the majority of pupils will meet in their daily lives, and for avoiding the traditional monotony of many recently produced school mathematics books.

AUBREY EMERSON

Henry Fanshawe School, Dronfield

Double feature

"This week's films: page 9
  Next week: $8\frac{1}{2}$"
  From a footnote to an advertised film in the Radio Times (per A. K. Austin).