Back to square one

DEAR SIR,

The following are genuine extracts from examination scripts.

1. Prove that $\sqrt{3} - \sqrt{2}$ is irrational.
   Answer. $\sqrt{3} = 1{\cdot}732$, $\sqrt{2} = 1{\cdot}414$.
   $\therefore \sqrt{3} - \sqrt{2} = 0{\cdot}318 = 1/\pi$, which is irrational.
2. Prove that the function $f:\mathbb{Z} \to \mathbb{Z}$ defined by $f(x) = 2x - 1$, for all $x \in \mathbb{Z}$, is one-to-one.
   Answer. $f(1) = 1$, so f is one-to-one.

Yours faithfully,

DES MACHALE

Department of Mathematics, University College, Cork, Ireland

Can an animal keep warm?

DEAR SIR,

I read with interest your article on how an animal keeps warm (*Gazette* No. 416, pp. 85–86), particularly as we have just completed a Computer Aided Learning package on this topic.

The request came from a biologist, not a mathematician, and of course her interest was more concerned with the result than the mathematics. As you will see (Fig. 1a), our 'animal' is made up from a series of cylinders (apart from triangular ears—not present in this example). In the printout reproduced here, the pupil answers the computer's question after each "?" and then the computer completes the calculation. The pupil responses have been underlined for greater clarity.

The nice feature of this program is that it provides rather more realism than a pure cylinder or sphere—we even have a 'Beaufort' series of cover codes—without getting bogged down with the arithmetic.

Yours sincerely,

BILL TAGG

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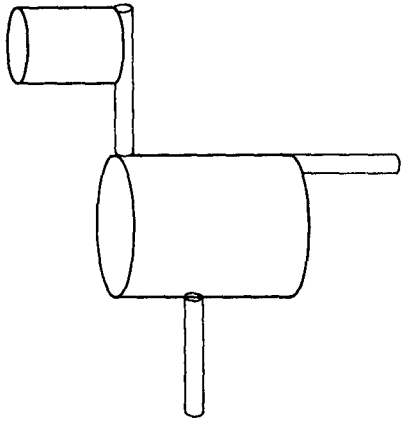

(a) The mathematical model

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<--          8 CM                -->

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(b) The computer picture

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