

PROBLEM OF THE WEEK
Solution of Problem No. 4 (Fall 2003 Series)

Problem: Show that any right triangle with integer sides is similar to one in the Cartesian plane whose hypotenuse is on the x -axis and whose three vertices have integer coordinates.

Solution (by Yifan Liang, Grad. in ECE, edited by the Panel)

Consider the triangle with vertices $(0, 0)$ and $(c^2, 0)$ with sides ac, bc, c^2 . It is similar to the given triangle, hence a right triangle. Its height is $h = \frac{ac \cdot bc}{c^2} = ab$. The coordinates of the third vertex are $\sqrt{b^2 c^2 - h^2} = b^2$ and $h = ab$, which are integers.

Also solved by:

Undergraduates: Chad Aeschliman (So. ECE), Jason Arema (Jr. Mgt), Akira Matsudaira (So. ECE), Jignesh V. Mehta (So. Phys) Justin Woo (So. ECE)

Graduates: Ankur Jain (ChE), Ashish Rao (ECE), Brahma N.R. Vanga (Nucl.)

Others: Prithwijit De (U.C.C. Cork, Ireland), Jim Hoffman (Av. Tech Cntr, Indpls), Namig Mammadov (Baku, Azerbaijan), Rob Pratt (with Feng Chen & Laiza DelaFuente, UNC, Chapel Hill), Taryn Quattrocchi (Gr. 12 Warren Central HS), Christopher Smith (Faculty, St. Cloud St. U., St. Cloud, MN), Ram Venkatachalam (Murex)

Two incorrect solutions were received.

Correction: Jignesh V. Mehta (So. Phys) was accidentally left off the list of solvers of Problem 3.