

# Cal Poly Department of Mathematics

## Puzzle of the Week

May 20-26, 2011

From Tom O'Neil:

Find all pairs of integers  $(x, y)$  which satisfy

$$4xy + y - 14x = 23$$

*Solutions should be submitted to Morgan Sherman:*

*Dept. of Mathematics, Cal Poly*

*Email: sherman1 -AT- calpoly.edu*

*Office: bldg 25 room 310*

*before next Friday. Those with correct and complete solutions will have their names listed on the puzzle's web site (see below) as well as in next week's email announcement. Anybody is welcome to make a submission.*

<http://www.calpoly.edu/~sherman1/puzzleoftheweek>

*Solution:* The only pairs of integers which solve the equation are  $(0, 23), (3, 5), (-1, -3), (-10, 3)$ .

The equation factors as  $(4x + 1)(2y - 7) = 39$ . The left hand side is a product of integers so we work through the only possible factors of 39, which are  $\pm 1, \pm 3, \pm 13, \pm 39$  to find the four solutions above.