

Cal Poly Department of Mathematics

Puzzle of the Week

Feb 25-Mar 3, 2011

Relayed to me by Richard Neufeld:

A flight of stairs contains 100 steps. How many ways are there to climb the flight if you are allowed to take either one or two steps at a time?

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 number of ways is equal to the 101st fibonacci number: 573147844013817084101.

If C_n is the number of ways of traveling n steps then it is not hard to see that $C_n = C_{n-2} + C_{n-1}$. Furthermore $C_1 = 1$ and $C_2 = 2$. Hence $C_n = f_{n+1}$ assuming we begin the Fibonacci sequence as $f_1 = 1, f_2 = 1$.