

# Cal Poly Department of Mathematics

## Puzzle of the Week

Feb 22-29, 2012

It is known that 34 is the smallest positive integer that cannot be obtained from the integers  $\{1, 2, 3, 4\}$  using only the operations of addition, subtraction, multiplication, exponentiation, and division, if each integer is to be used at most once (one can use as many parentheses as one likes). Find such an expression for 31, 32, 33, and 35.

*Solutions should be submitted to Morgan Sherman:*

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*before next Thursday. 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:* There are many solutions. Here is one set:

$$31 = 4 \times 2^3 - 1$$

$$32 = 4^2 \times (3 - 1)$$

$$33 = 4 \times 2^3 + 1$$

$$35 = 4 \times 3^2 - 1$$