

### October 2017 Puzzle

You are equipped with a single 2, 5, 7, and 10 along with the ability to combine them using them only using addition, subtraction, multiplication, division, and exponentiation. Your goal is to create each of the integers from 29 to 45 as well as 78, 81, & 87. You may use any number of parentheses to control the order of operations and in each case, you must use all four numbers exactly once.

### October 2017 Solution

While there multiple expressions that can be used to create some of the numbers, we present only one example for each.

$$29 = 2 * 7 + 5 + 10$$

$$30 = 7 * 10 / 2 - 5$$

$$31 = 7 * (5 - 2) + 10$$

$$32 = 2 * 10 + 5 + 7$$

$$33 = 7 * (10 - 5) - 2$$

$$34 = 2 * (5 + 7) + 10$$

$$35 = 5 * (2 + 7) - 10$$

$$36 = 5 * 10 - 2 * 7$$

$$37 = 10 * (5 - 2) + 7$$

$$38 = 7 * 10 - 2^5$$

$$39 = 2 * (7 + 10) + 5$$

$$40 = 10 * (7 - 5)^2$$

$$41 = 5 * 10 - 2 - 7$$

$$42 = 5^2 + 7 + 10$$

$$43 = 5 * 7 - 2 + 10$$

$$44 = 2 * (5 + 7 + 10)$$

$$45 = 10 * (7 - 2) - 5$$

$$78 = 2^7 - 5 * 10$$

$$81 = (10/5 + 7)^2$$

$$87 = 5 * (7 + 10) + 2$$