Problem of the Week
Problem D
Digit Calculator

The *digit sum* of a number is found by, first, summing its digits. If the sum is greater than 9, then the digits of the sum are added. This process is repeated until a single digit number is obtained.

The digit sum of 602 is 8 since $6 + 0 + 2 = 8$, and 8 is a single digit number.

The digit sum of 897 is 6. However, it takes two steps to reach this sum. First, $8 + 9 + 7 = 24$, which is not a single digit number. Second, $2 + 4 = 6$, which is a single digit number and the process stops after the two steps.

a) How many three-digit numbers have a digit sum of 5 that is reached in one step?

b) How many three-digit numbers have a digit sum of 5 that is reached in two steps?

c) How many three-digit numbers have a digit sum of 5 that is reached in three steps?