Problem of the Week
Problem A and Solution
What Number Am I?

Problem

I am a 3-digit number.

The sum of my digits is 11.

The product of my digits is 16.

My digits are in decreasing order from the hundreds digit to the ones digit.

I have no repeated digits.

What number am I?

Solution

We start by determining the ways to multiply three single-digits to get a product of 16. Here are the possibilities:

$1 \times 4 \times 4$ (in any order)
$1 \times 2 \times 8$ (in any order)
$2 \times 2 \times 4$ (in any order)

Since the number we are looking for does not have any repeated digits, then the digits in the number must be 1, 2, and 8. We can confirm this conclusion by noticing that the sum of these digits is $1 + 2 + 8 = 11$.

Since the digits appear in decreasing order, the number must be 821.