UW Math Circle

Homework

February 7, 2013

1. Show that $5^n + 2 \cdot 3^{n-1} + 1$ is divisible by 8 for any positive integer n.

2. Can a number that is written down with 100 zeros, 100 ones, and 100 twos be a perfect square?

3. Show that if a and b are digits (0-9) and $a + b$ is divisible by 7, then so is the three digit number aba.

4.* Find the smallest number X with the property that the sum of the digits in both X and $X + 1$ are divisible by 17.