A Clever Use for Congruences

First, prove the following.

**Lemma**: If $p$ is a positive integer and there is another positive integer $a < p$ where $a^{p-1} \not\equiv 1 \pmod{p}$, then $p$ is *not* a prime.

Use this lemma with $a = 2$ to show that 1111 is not a prime.