Homework #5

MATH 311 — Intro to Number Theory
due in class on Tuesday, Nov 15

Please print your name:

These problems are not suited to be done last minute!
Also, if you start early, you can consult with me if you should get stuck.

Problem 1.

(a) Evaluate $\phi(2016)$.

(b) Evaluate $\phi(10^n)$.

(c) Use Euler's theorem to compute $2^{666} \pmod{77}$.

Problem 2. For any integer a, show that a and a^{4n+1} have the same last (decimal) digit.

Problem 3. Use Euler's theorem to show that $51|(10^{32n+9}-7)$ for any integer $n \geqslant 0$.

Problem 4.

(a) Show that 25 is a pseudoprime to base 7.

(b) Show that $561 = 3 \cdot 11 \cdot 17$ is an absolute pseudoprime.

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