

HOMEWORK 6 - DUE FRIDAY NOV 8

1. (Schumer 4.1 Prob. 15)

- a) Find all primitive roots $\text{mod}25$
- b) Find all primitive roots $\text{mod}49$

2. (Schumer 4.2 Prob. 7)

Determine how many incongruent solutions (mod 77) there are to the following congruence relations.

- a) $x^6 \equiv 5(\text{mod}77)$
- b) $x^3 \equiv 6(\text{mod}77)$

3. (Schumer 4.2 Prob. 10)

Use Theorem 4.9 to determine whether the following congruences are solvable:

- a) $x^4 \equiv 4(\text{mod}53)$
- b) $x^3 \equiv 5(\text{mod}29)$
- c) $x^3 \equiv 18(\text{mod}101)$

4. (Schumer 4.3 Prob. 5)

Show that $x^2 \equiv -a^2(\text{mod}p)$ is solvable iff $p = 2$ or $p \equiv 1(\text{mod}4)$.

5. (Schumer 4.3 Prob. 8)

Show that if p is an odd prime and $p|(n^2 - 2)$ for some n then $p \equiv \pm 1(\text{mod}8)$.