

# Homework 1

Due: In class on Wednesday September 29th

Problem 1: Exercise 1.2.8 from Lecture Notes

Problem 2: Prove the following properties about congruences:

If  $a \equiv b \pmod{m}$  and  $c \equiv d \pmod{m}$  then

- (i)  $a + c \equiv b + d \pmod{m}$
- (ii)  $ac \equiv bd \pmod{m}$
- (iii)  $a^n \equiv b^n \pmod{m} \forall n$
- (iv)  $a + x \equiv b + x \pmod{m} \forall x$
- (v)  $ax \equiv bx \pmod{m} \forall x$
- (vi)  $a - x \equiv b - x \pmod{m} \forall x$