

Math 152, Spring 2006
Problem Set 1 (Part I of II)
Due: Friday, April 14

1. Find all incongruent solutions to each of the following congruences:
 - (a) $8x \equiv 6 \pmod{14}$
 - (b) $21x \equiv 14 \pmod{91}$
 - (c) $105x \equiv 7 \pmod{121}$
 - (d) $x^2 \equiv 2 \pmod{7}$
 - (e) $x^2 \equiv 3 \pmod{7}$

2. Determine the NUMBER of incongruent solutions to each of the following congruences. You don't need to write the actual solutions.
 - (a) $72x \equiv 47 \pmod{200}$
 - (b) $4183x \equiv 5781 \pmod{15087}$

3. Find all solutions to the equation $3x^2 + 2 = y^2$ and prove your answer is correct.

4. Find all solutions to the equation $7x^3 + 2 = y^3$ and prove your answer is correct.