Due Wednesday, November 10 at the beginning of class. All chapter and exercise numbers refer to Silverman's *A Friendly Introduction to Number Theory*, 4th edition.

(1) Prove your conjecture from Ex. 21.3 in the previous problem set.

(2) Find all odd primes p such that the following congruences have a solution.

    (a) $x^2 \equiv 10 \bmod p$

    (b) $x^2 \equiv 13 \bmod p$

(3) Ex. 22.3

(4) Ex. 22.6

(5) Ex. 22.7

(6) Suppose $x, y \in \mathbb{Z}$. Show that $\dfrac{x^2 - 2}{2y^2 + 3} \notin \mathbb{Z}$.

(7) Ex. 23.5