MAT 115B Homework 3

Avery Li

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1.

By observation, we have that the solutions to the $x^2 \equiv 1 \pmod 8$ are $x \equiv 1, 3, 5, 7 \pmod 8$.

2.

3.

We have that for $x^2 \equiv y^2 \pmod p \implies x^2 - y^2 \equiv \pmod p \implies (x+y)(x-y) \equiv$.

$$\begin{aligned} x^2 &\equiv y^2 \pmod p \\ x^2 - y^2 &\equiv 0 \pmod p \\ (x+y)(x-y) &\equiv 0 \pmod p \\ \implies x &\equiv \pm y \pmod p \end{aligned}$$

4.

a) $\left(\frac{11}{23}\right)$

b) $\left(\frac{-6}{11}\right)$

c) $\left(\frac{5}{17}\right)$

5.

6.

7.