MATH 113: DISCRETE STRUCTURES
HOMEWORK FOR MONDAY WEEK 14

Problem 1. Use Sunzi's Theorem to efficiently compute the congruence class of 17^2 modulo 35. (What is the value to $\overline{17}^2 \in \mathbb{Z}/5\mathbb{Z}$? and in $\mathbb{Z}/7\mathbb{Z}$? Use Sunzi's Theorem to push these results back into $\mathbb{Z}/35\mathbb{Z}$.)

Problem 2. Find all solutions to the system of congruences
$$x \equiv 1 \pmod 6$$
$$x \equiv 4 \pmod{15}.$$

Prove all your assertions along the way. (*Careful!* The moduli 6 and 15 are not relatively prime, so you can't appeal to Sunzi's Theorem.)