Name: _____

Directions: Show all work. No credit for answers without work.

1. [**2 points**] State the Chinese Remainder Theorem (CRT).

2. [**3 points**] Give the correspondence between $\mathbb{Z}_{12}$ and the set $\{(a_1, a_2) \colon a_1 \in \mathbb{Z}_4 \text{ and } a_2 \in Z_3\}$ implied by the CRT.

3. [**5 points**] Find a solution to the following system of congruences, if one exists.

$$x \equiv 17 \pmod{77}$$
$$x \equiv 4 \pmod{9}$$
$$x \equiv 21 \pmod{40}$$