CSE 311 Quiz Section 4: Apr 24, 2014

1 Student Questions

2 Problems #3 and #4 from Homework 3

3 Practice Problems

1. (13, Section 4.1, 7th edition) Assume a, b are integers, $a \equiv 4 \pmod{13}$ and $b \equiv 9 \pmod{13}$. Find integer $0 \leq c \leq 12$ such that:

   (a) $c \equiv 9a \pmod{13}$

   (b) $c \equiv 11b \pmod{13}$

   (c) $c \equiv a + b \pmod{13}$

   (d) $c \equiv 2a + 3b \pmod{13}$

   (e) $c \equiv a^2 + b^2 \pmod{13}$

   (f) $c \equiv a^3 - b^3 \pmod{13}$

2. (24, Section 4.1, 7th edition) Find integer a such that:

   (a) $a \equiv 43 \pmod{27}$, $-22 \leq a \leq 0$

   (b) $a \equiv 17 \pmod{31}$, $-14 \leq a \leq 14$

   (c) $a \equiv -11 \pmod{21}$, $90 \leq a \leq 110$

3. (35, Section 4.1, 7th edition) Show that if $n|m$, where n, m integers greater than 1, and if $a \equiv b \pmod{m}$, where a, b integers then:

   $$a \equiv b \pmod{n}$$

4. (37(a), Section 4.1, 7th edition) Find a counterexample to the following:

   If $ac \equiv bc \pmod{m}$ then $a \equiv b \pmod{m}$. Note that a, b, c, m are all integers and $m \geq 2$.