CSE311 Quiz Section: April 19, 2012

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

   (a) $c \equiv 9a \ (mod \ 13)$

   (b) $c \equiv 11b \ (mod \ 13)$

   (c) $c \equiv a + b \ (mod \ 13)$

   (d) $c \equiv 2a + 3b \ (mod \ 13)$

   (e) $c \equiv a^2 + b^2 \ (mod \ 13)$

   (f) $c \equiv a^3 - b^3 \ (mod \ 13)$

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

   (a) $a \equiv 43 \ (mod 27) \ , \ -22 \leq a \leq 0$

   (b) $a \equiv 17 \ (mod 31) \ , \ -14 \leq a \leq 14$

   (c) $a \equiv -11 \ (mod 21) \ , \ 90 \leq a \leq 110$

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

   $$a \equiv b \ (mod \ n)$$

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

   If $ac \equiv bc \ (mod \ m)$ then $a \equiv b \ (mod \ m)$. Note that a, b, c, m are all integers and $m \geq 2$.

5. For home: Solve 27, Section 4.1, 7th edition