Math 312, Section 102
Homework #5
due Tuesday, October 16, 2001 at the beginning of class

I. Rosen, Section 4.1, p. 135, #10

II. Rosen, Section 4.1, p. 137, #28

III. Let p be a prime. Suppose that $ac \equiv bc \pmod{p}$. If $c \not\equiv 0 \pmod{p}$, prove that $a \equiv b \pmod{p}$. (Thus modulo a prime, division within congruences works just the same as division within equalities does.)

IV. Prove Theorem 4.7 (Rosen, p. 133) by induction on k.

V. Find all solutions to the following congruences:
(a) $12x \equiv 20 \pmod{55}$
(b) $12x \equiv 20 \pmod{56}$
(c) $12x \equiv 20 \pmod{57}$

VI. Rosen, Section 4.2, p. 142, #10

VII. Rosen, Section 4.3, p. 151, #22

"A+ problem" (do not write up a solution to this problem, but if you can solve it, you know what you're doing!): Rosen, Section 4.3, p. 150, #14