Homework 1 - Math 580, Frank Thorne (thornef@mailbox.sc.edu)

Due Friday, September 4

(1) Prove: If $a|b$ and $b|c$, then $a|c$.

(2) Prove: If $d|a$, then $d|ca$ for any integer c.

(3) Dudley, p. 9: 1, 3, 5, 6, 7, 10, 12, 14; p. 19, 1, 3, 4, 7, 8, 10.

(4) You have egg timers which can measure exactly 9 minutes and 13 minutes, respectively. You wish to cook an egg for exactly five minutes. How can this be accomplished?

Bonus problem:

(1) We discussed the jug problem in lecture. Suppose you have two jugs of water, one of which can hold 89 gallons, and the other of which can hold 74. Note that $(89, 74) = 1$. Does this mean you can measure any integer number of gallons between 0 and $89 + 74$ gallons?