

**Math 215: Introduction to Advanced Mathematics**  
Problem Set 3

**Due Friday September 21**

Do pg. 54: 11

1) 1) a) Prove that  $ab > 0$  if and only if

$$[(a > 0 \text{ and } b > 0) \text{ or } (a < 0 \text{ and } b < 0)].$$

b) Prove that  $x^2 - x - 2 > 0$  if and only if  $(x < -1 \text{ or } x > 2)$ .

2) Prove that if  $k$  is an integer and  $3k + 1$  is even, then  $k$  is odd.

3) Prove that if the product of two integers is odd, then both of them must be odd.