Math 255 - Spring 2018
Homework 2

This homework is due on Monday, January 29.

1. Let a and b be integers, not both of which are zero. Prove that $(a, b) = ((a, b), b)$.

2. Let n and k be integers, not both of which are zero. Prove that $(k, n + k) = 1$ if and only if $(k, n) = 1$.

3. Prove that if $a|b$ and $a > 0$ then $(a, b) = a$.

Extra problem for graduate credit:

4. Let a and b be integers, not both of which are zero. Show that if $d = (a, b)$ and c is a common divisor of a and b, then $c|d$. (Hint: You will need to use Theorem 4.)

   Note that this is enough to show that when a and b are not zero, both definitions of the greatest common divisor given in class are equivalent.