Math 252 Homework # 1
R. Foote

1. For each of the following pairs of integers find their g.c.d. using the Euclidean Algorithm:
   (show steps; it is OK to use a calculator/computer to do each individual step)

   (a) 20785 and 44350 (b) 11391 and 5673 (c) 507885 and 60808

2. For each of the pairs of integers in Exercise 1 use the Euclidean Algorithm "backsolving method" to write the g.c.d. as a linear combination of the two integers: (show steps)

3. Find a generator for each of the following ideals in $\mathbb{Z}[i]$ (show steps):
   (i.e., find a greatest common divisor by the Euclidean Algorithm. Note that you do not have to "backsolve" in this exercise, but you might like to try it nonetheless.)

   (a) $(85\,,\, 1+13i)$ (b) $(47-13i\,,\, 53+56i)$.

4. Let R be a Euclidean Domain. Let m be the minimum integer in the set of norms of nonzero elements of R. Prove that every nonzero element of R of norm m is a unit. Deduce that a nonzero element of norm zero (if such an element exists) is a unit.