Math 255 - Spring 2018
Homework 5

This homework is due on Wednesday, February 21.

1. Give all integer solutions of the equation

$$23x + 14y = 2.$$

2. A farmer purchased 100 head of livestock for a total cost of $4000. Prices were as follow: Calves were $120 each, lambs were $50 each and piglets were $25 each. Assuming that the farmer purchased at least one animal of each species, what are the possibilities for how many of each species they bought?

3. Show that if $n > 4$ is a composite number, then n divides $(n-1)!$.

Extra problem for graduate credit:

4. True or false: Let n be a positive integer. If p and q are distinct primes that divide n, and each is greater than $n^{1/4}$, then $\frac{n}{pq}$ is an integer and is prime.

   If this statement is true, prove it. If it is false, give a counter-example.