Name: _____

Problem Set 5
Math 4281, Fall 2013
Due: Friday, October 11

Read Section17.3 in your textbook. You may stop after Example 7.

Complete the following items, staple this page to the front of your work, and turn your assignment in at the beginning of class on Friday, October 11.

1. List the irreducible polynomials in $\mathbb{Z}_2[x]$ of degrees $2, 3$, and 4.

2. Decide which of the following polynomials are irreducible in $\mathbb{Q}[x]$.

   a. $x^3 + 4x^2 - 3x + 5$

   b. $4x^3 - 6x^2 + 6x - 12$

   c. $x^4 - 180$

   d. $x^4 + x^2 - 6$

   e. $2x^4 + 3x^2 + 4x + 6$

   f. $x^5 + x^3 + x + 1$

3. Complete the following exercises in your textbook.

   pp. 284   #20, 21 (These are #19, 20 in the 2012 version of the textbook. The first problem is titled "Cyclotomic polynomials." Which version do you have - 2012 or 2013?)

   (Hint for #21: Consider $\Phi_n(x + 1)$.)

Signed: _____