MTH 65 – Winter Term 2010
Test 3 – Given February 22 **N**ame _____

You may not use any sort of calculator on this test.

1. Completely factor each expression; if a given expression does not factor make sure that you state that it is prime. Make sure that you lay out work in a manner consistent with that illustrated and discussed in class. This problem continues on pages 2, 3, and 4.

   (This problem is worth 78 points total)

   a. Factor $x^2 + 3x - 10$.

   b. Factor $2x^2 + 6xy + 4y^2$.

   c. Factor $x^3 - y^3$.

d. Factor $36m^2 - 12m + 1$.

e. Factor $-6x^{11}y^9 + 3x^4y - 9x^6yz^2$.

f. Factor $x^2y^2 - a^2b^2$.

g. Factor $x^2 + 16$.

h. Factor $x^2\ y^2 + 8xy + 16$.

i. Factor $4x^2 - x - 5$.

j. Factor $y^2 + 14y + 28$.

k. Factor $x^{10} - 6x^5\ y^3 - 16y^6$

l. Factor $x^4 + 6 - 3x^6 - 18x^2$

m. Factor $x^{10} - 16x^2$.

n. Factor $x^3 + 125$.

o. Factor $6w^2 + 66w + 168$.

2. Consider the object in Figure 1. The larger square has had squares cut from each corner and the length of each side of these four squares is 2 cm.; that is, each of the white squares has an area of 4 cm^2. (This problem is worth 10 points total)

   a. The length of each side of the larger square has been labeled x. Find a formula for the combined area of the five lettered rectangles. (Hint: What is the area of the larger square? How much area was cut way from this?) ***Ignore the unit of cm while working this part of the problem***.

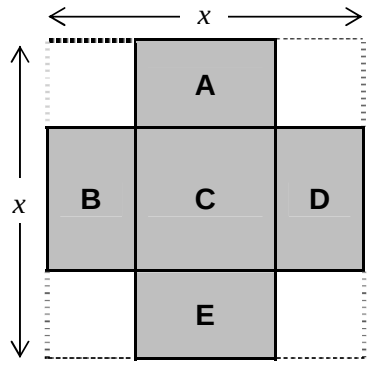

Figure 1

   b. Factor the area formula you came up with in part (a) of this question.

   b. How could you rearrange the five lettered rectangles so that the factored form of the area formula is really apparent? (You may answer this question by simply rearranging the pieces into the appropriate layout and labeling the result in an appropriate manner). ***Ignore the unit of cm while working this part of the problem***.

3. Determine all of the values of b that would make the trinomial $3x^2 + bx - 2$ factorable. That is, what values of b would result in a trinomial that ***is not prime***.

   Write down the resultant trinomials in both expanded and factored form.

   (This problem is worth 12 points total)

Hint

If the value of b was 20, the resultant trinomial would be $3x^2 + 20x - 2$ which is prime. So 20 ***is not*** one of the values you are looking for.

If the value of b was 1, the resultant trinomial would be $3x^2 + x - 2$ which ***is*** factorable. So 1 ***is*** one of the values you are looking for.