Mathematics 1275/D225 **Quiz #2**
Instructor: Suman Ganguli **Due: Wed Feb 28** **Name:** _____

Question:	1	2	Total
Points:	6	4	10
Score:			

1. (6 points) Factor the following quadratic polynomials.

   You can use the ac-method (in these cases, the "c-method", since $a = 1$ in all these), but you can just write down the factorization (i.e., you don't need to go through the steps of "splitting the linear term" and factoring by grouping.)

   Extra credit: check your solutions by multiplying out your factorization (i.e., use "FOIL").

   a. $x^2 + 14x + 49 =$

   Solution: Two numbers which multiply to $ac = 49$ and which sum to $b = 14$ are 7 and 7. Hence:

   $$x^2 + 14x + 49 = (x + 7)(x + 7) = (x + 7)^2$$

   Check: $(x + 7)(x + 7) = x^2 + 7x + 7x + 49 = x^2 + 14x + 49$

   b.

   $$y^2 - 5y + 4 =$$

   Solution: Two numbers which multiply to $ac = 4$ and which sum to $b = -5$ are -4 and -1. Hence:

   $$y^2 - 5y + 4 = (y - 4)(y - 1)$$

   Check: $(y - 4)(y - 1) = y^2 - y - 4y + 4 = y^2 - 5y + 4$

   c.

   $$x^2 + 14x - 32 =$$

   Solution: Two numbers which multiply to $ac = -32$ and which sum to $b = 14$ are 16 and -2. Hence:

   $$x^2 + 14x - 32 = (x + 16)(x - 2)$$

   Check: $(x + 16)(x - 2) = x^2 - 2x + 16x - 32 = x^2 + 14x - 32$

2. (4 points) Factor the following using the ac-method. For this exercise, show the steps of splitting the linear term and factoring by grouping:

   $$3x^2 + 14x + 15 =$$

   Solution: Since $a = 3, b = 14, c = 15$, we need to find two factors of $ac = 3(15) = 45$ which sum to $b = 14$. Two such numbers are 9 and 5. We use these to "split the linear term" $14x$ and then factor by grouping:

   $$3x^2 + 14x + 15 = 3x^2 + 9x + 5x + 15 = 3x(x + 3) + 5(x + 3) = (x + 3)(3x + 5)$$

   We can check by FOIL: $(3x + 5)(x + 3) = 3x^2 + 9x + 5x + 15 = 3x^2 + 14x + 15$