Math 115E Activity 14

Chapter 5 Section 1-2
Factoring Quadratics Part 2

How to factor quadratic equations

Quadratic factoring when a = 1:
When factoring, the form $x^2 + bx + c$
can be factored as $(x + m)(x + n)$
Start with real numbers m *and* n *so:*
they both multiply to c *and both add to* b
There is not a value in front of either x

Quadratic factoring when a ≠ 1:
When factoring, the form $\boldsymbol{a}x^2 + bx + c$
can be factored as $(px + m)(qx + n)$
Start with two real numbers such that:
multiply to $\boldsymbol{a} \cdot c$ *and yet add to* b
then we re-group the terms and factor

Example:Factor $3x^2 - 11x + 10$

Step 1: Find the factors of $3 * 10 = 30$ that add up to -11, (Write the factors if needed)

Step 2: The factors of 30 are: $\pm(1, 30), \pm(2, 15), \pm(3, 10), \pm(5, 6)$,
so the pair that adds to -11 is -5 and -6

Step 3: Rewrite the quadratic: $3x^2 + (-6x - 5x) + 10 = 0$

Step 4: Regroup so that each group has a common factor: $(3x^2-6x)+(-5x+10) = 0$

Step 5: Factor out a common term: $(3x)(x - 2) - 5(x - 2) = 0$

Step 6: Factor again with the $x-2$ term: $(3x-5)(x-2) = 0$

DONE: So starting with $3x^2 - 11x + 10 = 0$, we got $(3x - 5)(x - 2) = 0$

Note: If we arn't able to factor again in Step 5, then go back to Step 3 and swap the factor pair.

Factor the following quadratic equations

#1) $x^2 + 9x + 14$

#2) $x^2 - 8x + 7$

#3) $x^2 + x - 30$

#4) $3x^2 + 10x + 8$

#5) $2x^2 - 9x + 10$

#6) $2x^2 - 6x - 20$

#7) $9x^2 - 27x + 18$

#8) $4x^2 - 13x + 10$

#9) $2x^2 - 13x - 7$

#10) $4x^2 + 20x + 25$

#11) $3x^2 - 19x + 20$

#12) $8x^2 - 6x - 9$

Find two numbers such that:
the first number and the second number both multiply to 6,
and the first plus the product of 4 and the second number give us -14

Expand $(2x + 3)(3x - 1)$