1-3 Factoring Polynomials

Objectives:

1-3a: I can factor difference of squares binomials.
1-3b: I can factor expressions using multiple factoring methods.
Review 1-1c: I can solve equations using factoring

Bell Work: Consider #18 from homework

$$-5b^2 + 25b + 70$$

Write a list of steps describing how you would factor this. (Describe in words what you'd do generally (that is, no need to talk about numbers specific to this problem yet))

$$ax^2 + bx + c$$

$$a, b, c$$

Bell Work: #18 from homework

$-5b^2 +25b +70$

1) Factor out negative <u>GCF</u> (since the leading coefficient is negative, GCF is negative).

2) Then <u>factor trinomial</u> by:

  a) finding factors of ac that add up to b, then

  b) splitting bx to create a polynomial; and finally,

  c) <u>factor by grouping</u> (which includes GCF and then a GCBF!)

Using pink syllabus, label the underlined words in paragraph with 1-1a, 1-2b, etc. using your RED PEN

Let's review/relearn how to factor using the problem from the bellwork: $-5b^2 +25b +70$, following the reasoning given in our paragraph

$$-5 \big) 1 \cdot b^2 - 5b - 14 \big)$$

$$ax^2 + bx + c$$

$$b^2 + 2b - 7b - 14$$

$$b(b+2) - 7(b+2)$$

$$\boxed{-5(b+2)(b-7)}$$

$$\begin{array}{c|c} * & + \\ ac & b \end{array}$$

Factors (ac) | Add to b

$$\begin{array}{c|c} -14 & -5 \\ \hline 1 \cdot 14 & \\ 2 \cdot 7 & \to 2 - 7 \checkmark \end{array}$$

Take 10 minutes to work on your homework, especially #1-12. Keep today's bellwork notes handy to help guide you.

I will answer questions as a group after, but I'll wander to check in as well.

Factoring Methods

1. GCF

2. Grouping

3. Trinomial

And today... 4. Difference of Squares

Completely factor the quadratic expression.

What two methods would apply here?

① GCF   ② Trinomial

$$2x^3 + 9x^2 + 4x$$

$x(2x^2 + 9x + 4)$

$$\begin{array}{c|c} 8 & 9 \\ \hline 1 \cdot 8 & \checkmark \end{array}$$

$2x^2 + 8x + x + 4$

$x(2x(x+4) + 1(x+4))$

$x(x+4)(2x+1)$

Completely factor the quadratic expression.

$$x^3 + 6x^2 + 9x$$

Factor each.

$-2x^2 - 14x - 20$

$-3x^2 - 2x - 8$

$-2(x^2 + 7x + 10)$

$+10 \mid 7$

$-2(x^2 + 2x + 5x + 10)$

$1 \cdot 10$

$-2(x(x+2) + 5(x+2))$

$2 \cdot 5$

$(-2)(x+2)(x+5)$

$x \cdot a + 5 \cdot a$

$a(x+5)$

Hint: Always factor out a negative GCF if it is on the first term.

Solve by factoring

$$4m^2 - 10m + 4 = 0$$

Solve by factoring

$$2n^2 + 5n + 7 = 5$$

Hmmm...now what?

$$x^2 - 4 \longrightarrow \sqrt{4} = 2 \boxed{4x^2 - 9}$$

$$\sqrt{x^2} = x$$

$$(x + 2)(x - 2)$$

$$x^2 - 2x + 2x - 4$$

$$x^2 - 4 \checkmark$$

<u>Solve</u> by factoring

$$x^2 - 4 = 0 \qquad\qquad 4x^2 - 9 = 0$$