Unit #1 Day #3
Factoring Review

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Objectives:
- Students will be able to factor using all four methods of factoring.
- Students will understand how the sign of the value of "c" affects factoring.

A2 Unit 1 Day 3

Interest Inventory Due

Learning Channels Inventory Due

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There are four different ways to factor:

** **Factoring:** rewriting a sum as a product **

1. Greatest Common Factor (GCF)

2. Difference of Squares

3. Leading Coefficient of One (Diamonds)

4. Leading Coefficient is Not One (Box & Diamond)

4 Factoring Methods

METHOD #1: Greatest Common Factor

GCF = "undistributing"

Identify the largest number that ALL terms have in common AND identify the greatest amount of variables that ALL terms have in common. Divide all of that out.

EX #1: $\dfrac{4x^2}{4} - \dfrac{12x}{4} + \dfrac{16}{4}$

$$4(x^2 - 3x + 4)$$

EX #2: $\dfrac{9x^3}{3x^2} - \dfrac{24x^2}{3x^2}$

$$3x^2(3x - 8)$$

GCF

METHOD #2: Difference of Squares *(2 terms, minus in middle)*

$$\sqrt{a^2} - \sqrt{b^2} = (a+b)(a-b)$$

EX #3: $\sqrt{x^2} - \sqrt{4} = (x+2)(x-2)$
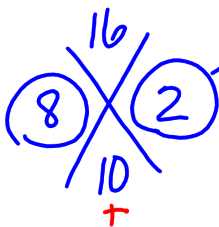
EX #4: $\sqrt{16y^2} - \sqrt{81} = (4y+9)(4y-9)$

1   4   9   16   25   36   49   64   81   100

EX #5: $75z^2 - 48$

$$3(\sqrt{25z^2} - \sqrt{16})$$
$$\downarrow$$
$$3(5z+4)(5z-4)$$

Difference of Squares

METHOD #3: Trinomials with a Leading Coefficient of One (Diamonds) $= x^2 + bx + c$
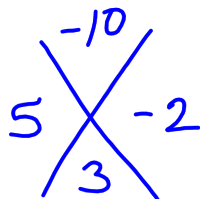
EX #6: $x^2 + 10x + 16$

16
8 × 2
10

→ factors

$(x+8)(x+2)$

$(x+8)$
$(x+2)$

EX #7: $x^2 + 3x - 10$

-10
5 × -2
3

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

Diamond

3

* Be careful with + and - signs! *

EX #8: $x^2 \ \widehat{-1x} - 12$

$$\begin{array}{c} -12 \\ -4 \diagdown\diagup 3 \\ -1 \end{array} \qquad (x-4)(x+3)$$

EX #9: $x^2 - 17x + 72$

$$\begin{array}{c} 72 \\ -8 \diagdown\diagup -9 \\ -17 \end{array} \qquad (x-8)(x-9)$$

Diamond

METHOD #4: Trinomials with a Leading Coefficient Other Than One (Box and a Diamond) $ax^2 + bx + c$

EX #10: $2x^2 + 11x + 12$ $\boxed{GCF}$

$$\begin{array}{c} 24x \\ 8x \diagdown\diagup 3x \\ 11x \end{array}$$

	x	4
$2x$	$2x^2$	$8x$
3	$3x$	12

$(2x+3)(x+4)$

EX #11: $3x^2 - 16x + 5$ *don't make the x's negative*

$$\begin{array}{c} 15x^2 \\ -15x \diagdown\diagup -1x \\ -16 \end{array}$$

	$3x$	-1
x	$3x^2$	$-1x$
-5	$-15x$	5

$(3x-1)(x-5)$

Box & Diamond

EX #12: $4x^2 - 17x - 15$

$$-60$$
$$-20 \times 3$$
$$-17$$

	x	-5
$4x$	$4x^2$	$-20x$
3	$3x$	-15

$(4x+3)(x-5)$

EX #13: $\dfrac{-12x^3 - 22x^2 + 70x}{-2x \quad -2x \quad -2x}$

$-2x(6x^2 + 11x - 35)$

$$-210$$
$$21 \times -10$$
$$11$$

	$2x$	7
$3x$	$6x^2$	$21x$
-5	$-10x$	-35

$-2x(3x-5)(2x+7)$

Box & Diamond

What does "c" tell us?

In $ax^2 + bx + c$, if c is positive...

$$? \times{\huge +} ?$$

Same sign
— both + or both neg.

In $ax^2 + bx + c$, if c is negative...

$$? \times{\huge -} ?$$

opposite signs

"c"
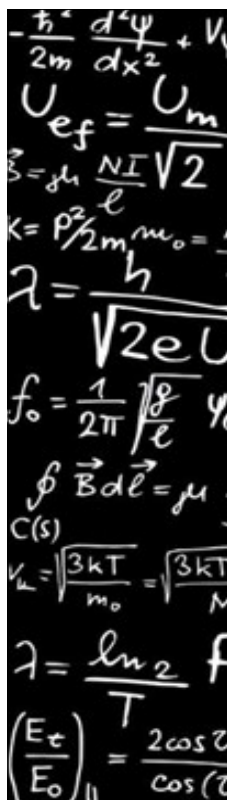
Homework:

Unit #1 Day #3 worksheets

HW

① $2x^2 - 8 = 42$

② $-3(4x-1)^2 + 7 = -20$

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③ $-5\sqrt{2x-1} + 6 = -9$

④ $\dfrac{2x}{4} - \dfrac{3x}{2} + \dfrac{5}{3} = 6$

⑤ $-2|x+3| + 5 = 6x + 7$

⑥ $-|1-2x| + 3x = x + 5$

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⑦ $(4x^2y^{-3})^3$

⑧ $(6x^{-3}y^{-4})^{-2}(3x^2y^{-1})^3$

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⑨　　$\left(\dfrac{125}{64}\right)^{-\frac{2}{3}}$

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