Howdy!!!!

Coach Watson

FOA

Find your seat

*Pencil

Algebra 1 Name: _____

Number Diamonds Puzzle #1

7 6 ■ 1 6	19 10 ■ 9 90	3 2 ■ 1 2
12 7 ■ 5 35	14 10 ■ 4 40	11 6 ■ 5 30
12 9 ■ 3 27	8 7 ■ 1 7	17 9 ■ 8 72
7 3 ■ 4 12	13 9 ■ 4 36	6 3 ■ 3 9

Algebra 1 Name: _____

Number Diamonds Puzzle #2

-12 -7 ■ -5 35	-10 -6 ■ -4 24	-13 -7 ■ -6 42
-15 -9 ■ -6 54	-12 -9 ■ -3 27	-4 -2 ■ -2 4
-7 -5 ■ -2 10	-12 -6 ■ -6 36	-9 -2 ■ -7 14
-9 -8 ■ -1 8	-17 -14 ■ -3 42	-10 -5 ■ -5 25

Algebra 1 Name: _____

Number Diamonds Puzzle #3

5 8 ■ -3 -24	1 -3 ■ 4 -12	5 9 ■ -4 -36
8 10 ■ -2 -20	-3 -5 ■ 2 -10	2 8 ■ -6 -48
4 -1 ■ 5 -5	6 9 ■ -3 -27	-8 -10 ■ 2 -20
7 9 ■ -2 -18	-2 -9 ■ 7 -63	-1 -4 ■ 3 -12

Algebra 1 Name: _____

Number Diamonds #4

-1 -2 ■ 1 -2	-1 -10 ■ 9 -90	-7 -10 ■ 3 -30
-4 -3 ■ -1 3	6 5 ■ 1 5	5 8 ■ -3 -24
-8 -7 ■ -1 7	-12 -10 ■ -2 20	-7 -5 ■ -2 10
-2 -6 ■ 4 -24	-1 -6 ■ 5 -30	4 10 ■ -6 -60

Algebra 1 Name: _____

Number Diamonds Puzzle #5

9 / 20	9 / 0	-4 / 3
-6 / -16	5 / 6	-3 / -18
-1 / -20	6 / 0	3 / -28
4 / -32	4 / -5	-5 / -6

Algebra 1 Name: _____

Number Diamonds Puzzle #6

-9 / 8	-2 / -15	17 / 70
1 / -1	-3 / -10	-4 / -45
8 / -24	-10 / 0	18 / 81
-6 / -16	11 / 30	0 / -36

Algebra 1 Name: _____

Number Diamonds Puzzle #7

0 / -16	14 / 49	16 / 64
8 / 16	0 / -49	-2 / 1
0 / -1	-12 / 36	4 / 4
20 / 100	-18 / 81	0 / -64

Todays Notes

Algebra 1 Unit 7: Quadratic Expressions Notes

Name: _____ Block: _____

Unit 7: Quadratic Expressions

Learning Goal 7.2 – Factoring

In this unit, you will learn how to do the following:

Learning Target #2: Factoring

- Factor the GCF out of a polynomial
- Factor a polynomial when a = 1
- Factor a polynomial when a ≠ 1
- Factor special products (difference of two squares and perfect square trinomials)

Mon, 1/6 *Day 1:* Review Expectations, Classify Polynomials	Tues, 1/7 *Day 2:* Adding & Subtracting Polynomials	Wed, 1/8 *Day 3:* Multiplying Polynomials	Thurs, 1/9 *Day 4:* Applications with Polynomials	Thurs, 1/10 *Day 5:* Factoring Trinomials 7.1 Test
Mon, 1/13 *Day ~~6~~ 5:* Factoring Trinomials	Tues, 1/14 *Day ~~7~~ 6:* Factoring Trinomials	Wed, 1/15 *Day ~~8~~ 7:* Special Factoring Types	Thurs, 1/16 *Day ~~9~~ 8:* Factoring Practice Day	Thurs, 1/17 *Day 10* ~~Learning Goal 7.1 &~~ **7.2 Assessment**

Tutoring Times

	Monday	Tuesday	Wednesday	Thursday	Friday
AM	Mrs. Jackson 7:45 – 8:15 Room 1210	Mr. Phillips 7:45 – 8:15 Room 1206	Mrs. Jackson & Mr. Webb 7:45 – 8:15 Room 1210 Room 1205	Mr. Watson & Mr. Phillips 7:45 – 8:15 Room 1208 Room 1206	Mr. Watson 7:45 – 8:15 Room 1208
PM	NONE	Mrs. Petersen 3:30 – 4:30 Room 1210	NONE	NONE	NONE

Day 5 – Factor Polynomials (+, +)

Review and Connect: Multiply the following polynomials.

a. $(x + 2)(x + 4)$

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

$x^2 + 6x + 8$

b. $(2x + 3)(x + 1)$

	x	1
$2x$	$2x^2$	$2x$
3	$3x$	3

$2x^2 + 5x + 3$

c. $3x(x + 5)$

$3x^2 + 15x$

d. $(x + 3)^2$

$(x + 3)(x + 3)$

	x	3
x	x^2	$3x$
3	$3x$	9

$x^2 + 6x + 9$

Review and Connect: Study the table below and answer the following questions:

Factored Form no x^2	Work	Trinomial Form ($ax^2 + bx + c$)
$(x + 2)(x + 7)$	$x^2 + 7x + 2x + 14$	$x^2 + 9x + 14$
$(x + 5)(x + 3)$	$x^2 + 3x + 5x + 15$	$x^2 + 8x + 15$
$(2x + 3)(x + 6)$	$2x^2 + 12x + 3x + 18$	$2x^2 + 15x + 18$
$(3x + 2)(x + 5)$	$3x^2 + 15x + 2x + 10$	$3x^2 + 17x + 10$

1. Explain where the "ax^2" term comes from:

multiply the first term in each binomial together

2. Explain where the "c" term comes from:

multiply the two #'s together

3. Explain where the "bx" term comes from:

multiply the outside term and inside terms together and then add them.

Review and Connect: Determine the missing numbers as indicated by the "**?**" sign. Place the missing number above each "**?**" sign.

a. $(x + \mathbf{?})(x + 3) = x^2 + 5x + 6$

b. $(x + 6)(x + 3) = x^2 + \mathbf{?}x + 18$

c. $(x + 8)(x + \mathbf{?}) = x^2 + \mathbf{?}x + 32$

d. $(2x + \mathbf{?})(x + 4) = 2x^2 + 9x + 4$

e. $(5x + 3)(x + 2) = 5x^2 + \mathbf{?}x + 6$

f. $(3x + 4)(x + \mathbf{?}) = 3x^2 + \mathbf{?}x + 20$

g. $(7x + \mathbf{?})(x + 4) = \mathbf{?}x^2 + 31x + 12$

h. $(x + \mathbf{?})(x + \mathbf{?}) = x^2 + 5x + 4$

i. $(2x + \mathbf{?})(x + \mathbf{?}) = 2x^2 + 15x + 28$

What is Factoring?

To be successful at the remaining lessons in the unit, you have to understand what is meant by the term factoring or factor an expression. Look at the following pictures, examples, and definitions to understand what is meant by "factoring:

to get rid of x^2

Factoring

Factoring means to find out which two expressions you multiplied together to get one single expression. Factoring is like "splitting" an expression into a product of simpler expressions. Factoring is also the opposite of expanding or distributing.

$$2(y+3) \underset{\text{Factor}}{\overset{\text{Expand}}{\rightleftarrows}} 2y+6$$

Numbers have factors:

$$\underset{\text{Factor}}{2} \times \underset{\text{Factor}}{3} = 6$$

Expressions have factors too:

$$\underbrace{(x+3)}_{\text{Factor}}\underbrace{(x+1)}_{\text{Factor}} = x^2 + 4x + 3$$

Factoring by Guess and Check Method

If you preferred the distributive method for multiplying polynomials, then you will probably understand/like factoring by the guess and check method. The factoring by guess and check involves understanding where your ax^2, bx, and c terms come from.

Example 1: Factor $x^2 + 7x + 12$

General Steps	Examples
1. Check to see if the polynomial has a greatest common factor. None 2. Set up two empty sets of parenthesis below the polynomial. 3. The first numbers must multiply together to equal the first term, ax^2. ( ) ( ) 4. The second numbers must multiply together to equal the last term **c**. ( ) ( ) 5. Multiply the outside terms and then the inside terms. When those terms are added together, they should equal the middle term, ***b***. ( ) ( ) 6. Check your answer by multiplying the two binomials together.	$x^2 + 7x + 12$ $(x+3)(x+4)$ ✓ $4x + 3x = 7x$ $(x+2)(x+6)$ ✗ $6x + 2x = 8x$ $(x+12)(x+1)$ ✗ $1x + 12x = 13x$

Check

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

$x^2 + 7x + 12$

Example 2: Factor $3x^2 + 23x + 14$

General Steps	Examples
1. Check to see if the polynomial has a greatest common factor. None 2. Set up two empty sets of parenthesis below the polynomial. 3. The first numbers must multiply together to equal the first term, ax^2. ( )( ) 4. The second numbers must multiply together to equal the last term **c**. ( )( ) 5. Multiply the outside terms and then the inside terms. When those terms are added together, they should equal the middle term, ***b***. ( )( ) 6. Check your answer by multiplying the two binomials together.	$3x^2 + 23x + 14$ $(3x \quad 7)(x \quad 2)$ 6x 7x 13x ✗ $(3x \quad 1)(x \quad 14)$ 42x 1x 43x ✗ $(3x + 2)(x + 7)$ 21x 2x 23x ✓

Example 3: $2x^2 + 14x + 20$

General Steps	Examples
1. Check to see if the polynomial has a greatest common factor. 2. Set up two empty sets of parenthesis below the polynomial. 3. The first numbers must multiply together to equal the first term, ax^2. ( )( ) 4. The second numbers must multiply together to equal the last term **c**. ( )( ) 5. Multiply the outside terms and then the inside terms. When those terms are added together, they should equal the middle term, ***b***. ( )( ) 6. Check your answer by multiplying the two binomials together.	$\frac{2x^2}{2} + \frac{14x}{2} + \frac{20}{2}$ $2(x^2 + 7x + 10)$ $2(x + 5)(x + 2)$ 2x 5x 7x ✓ $2(x \quad 10)(x \quad 1)$

Practice

Directions: Factor each of the following trinomials.

a. $x^2 + 8x + 15$

$(x+3)(x+5)$ $\begin{array}{r} 5x \\ 3x \\ \hline 8x \end{array}$

b. $2x^2 + 21x + 40$

$(2x+5)(x+8)$ $\begin{array}{r} 16x \\ 5x \\ \hline 21x \end{array}$

c. $x^2 + 10x + 21$

d. $\frac{5x^2}{5} + \frac{20x}{5} + \frac{15}{5}$

$5(x^2+4x+3)$

$5(x+1)(x+3)$ $\begin{array}{r} 3x \\ 1x \\ \hline 4x \end{array}$

$5(x+3)(x+1)$ $\begin{array}{r} 1x \\ 3x \\ \hline 4x \end{array}$

e. $7x^2 + 39x + 20$

$(7x+4)(x+5)$ $\begin{array}{r} 35x \\ 4x \\ \hline 39x \end{array}$

f. $3x^2 + 22x + 40$

x

$(3x+10)(x+4)$ $\begin{array}{r} 12x \\ 10x \\ \hline 22x \end{array}$

g. $x^2 + 17x + 70$

h. $4x^2 + 32x + 28$

i. $x^2 + 12x + 36$

j. $5x^2 + 32x + 35$

k. CHALLENGE: $10x^2 + 21x + 8$

l. CHALLENGE: $4x^2 + 12x + 5$

Additional Practice

Algebra 1 Unit7: Quadratic Expression Practice

Day 5 – Factor Trinomials (+, +) **Name:** _____

Practice Assignment **Date:** _____ **Block:** _____

Review: **Subtract** $(5x^2 - 3x + 2) - (8x^2 + 4x - 1)$

Factor the expressions:

1. $x^2 + 16x + 64$

2. $3x^2 + 19x + 6$

3. $2x^2 + 16x + 32$

4. $x^2 + 6x + 9$

5. $5x^2 + 36x + 7$

6. $2x^2 + 26x + 60$

7. $7x^2 + 22x + 16$

8. $x^2 + 6x + 8$

9. $2x^2 + 21x + 10$

10. Determine the values of *k* and *n*.

a. $(x + 4)(x + k) = x^2 + nx + 24$

b. $(x + k)(x + 1) = x^2 + nx + 5$

c. $(x + 5)(x + n) = x^2 + 8x + n$