

Warm Up

March 11, 2019

Complete Diamond Math Problems #1-28

THEN

What is the
product of the two
numbers on the
left and right?

FIRST

What number
plus 3 equals 11?

3

11

What We Know About Factoring

- Separation of a polynomial into products.
- Types of Factoring
 - Greatest Common Factor
 - Grouping - 4 TERMS

Factoring (Quadratic) Trinomials

$$\text{Ex \#1: } x^2 - 13x + 30$$

Goal: To factor the trinomial.

- 1.) What does the ^{times!} product of two binomials look like?

$$\underline{(a \pm b)(a \pm b)}$$

- 2.) Are all of the polynomial expressions equivalent to example #1? If so, how do you know?

- 3.) Factor each of the expressions below.

- 4.) Which one(s) do you think lead to the correct answer? Why do you think so?

Example #1: $x^2 - 13x + 30$

$x^2 - 1x$ $x(x-1)$	$-12x + 30$ $-6(2x-5)$	$(x^2 - 3x)$ $x(x-3)$	$(-10x + 30)$ $-10(x-3)$	$(x^2 - 4x)$ $x(x-4)$	$(-9x + 30)$ $-3(3x-10)$	$(x^2 - 5x)$ $x(x-5)$	$(-8x + 30)$ $-2(4x-15)$
$(x^2 - 8x)$ $x(x-8)$	$(-5x + 30)$ $-5(x-6)$	$(x^2 - 9x)$ $x(x-9)$	$(-4x + 30)$ $-2(2x-15)$	$(x^2 - 10x)$ $x(x-10)$	$(-3x + 30)$ $-3(x-10)$	$(x^2 - 12x)$ $x(x-12)$	$(-1x + 30)$ $-1(x-30)$
$(x^2 - 1x)$ $x(x-1)$	$(+14x + 30)$ $+2(7x+15)$	$(x^2 - 2x)$ $x(x-2)$	$(+15x + 30)$ $+15(x+2)$	$(x^2 - 3x)$ $x(x-3)$	$(+16x + 30)$ $+2(8x+15)$	$(x^2 - 5x)$ $x(x-5)$	$(+18x + 30)$ $+6(3x+5)$

5.) For the one(s), you think are correct, what do the numbers in the polynomial have in common with the numbers in the trinomial?
 the numbers multiplied to equal 30 and added to equal -13.

Factoring (Quadratic) Trinomials

6.) How could you find the correct "splitting numbers" without having to try so many?

7.) What do you think the correct answer is for example #1 and if the goal is to write the polynomial as two binomials?

Example #1: _____

Factoring (Quadratic) Trinomials

Ex #2: $x^2 + 7x + 12$

1) $a=1$ $b=7$ $c=12$

2) $ac=12$

3)

1	12
2	6
3	4

~~| | |
|---|---|
| 3 | 4 |
| 7 | |~~

4) $x^2 + 3x + 4x + 12$

5) $(\underbrace{x^2 + 3x}_x)(\underbrace{4x + 12}_4)$

~~$x(x+3) + 4(x+3)$~~

6) $(x+4)(x+3)$

How to Factor

1.) Identify A, B, and C.

2.) Multiply A and C.

3.) Find the factors of AC that add to equal B.

4.) Rewrite "b" as the sum of the factors.

5.) Factor by grouping.

6.) Write your answer as the product of two binomials

Set 1: Positive, Positive

$$y = \frac{20}{x}$$

$$n^2 + 9n + 20$$

$a=1$ $b=9$ $c=20$

$ac=20$

1	20	20 9
2	10	
4	5	

$$\left(\frac{n^2 + 4n}{n} \right) \left(\frac{5n + 20}{5} \right)$$

$$\cancel{n}(n+4) + \cancel{5}(n+4)$$

$$(n+5)(n+4)$$

$$w^2 + 9w + 18$$

$a=1$ $b=9$ $c=18$

$ac=18$

1	18
2	9
3	6

$$(w+3)(w+6)$$

Set 2: Positive, Negative

$$n^2 + 3n - 18$$

$$a=1 \quad b=3 \quad c=-18$$

$$ac = -18$$

1	-18
2	-9
3	-6
<hr/>	
-1	18
-2	9
-3	6

$$(n-3)(n+6)$$

$$x^2 + 2x - 8$$

$$a=1 \quad b=2 \quad c=-8$$

$$ac = -8$$

-1	8	-2	4
-2	4	2	-8

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

Set 3: Negative, Negative

$$a^2 - 2a - 3$$

$$x^2 - 7x - 30$$

Set 4: Positive Negative

$$a^2 + 6a - 16$$

$$x^2 - 14x - 72$$

Examples with a GCF!

$$4k^2 + 12k + 8$$

GCF



$$2x^2 - 8x - 24$$

GCF

