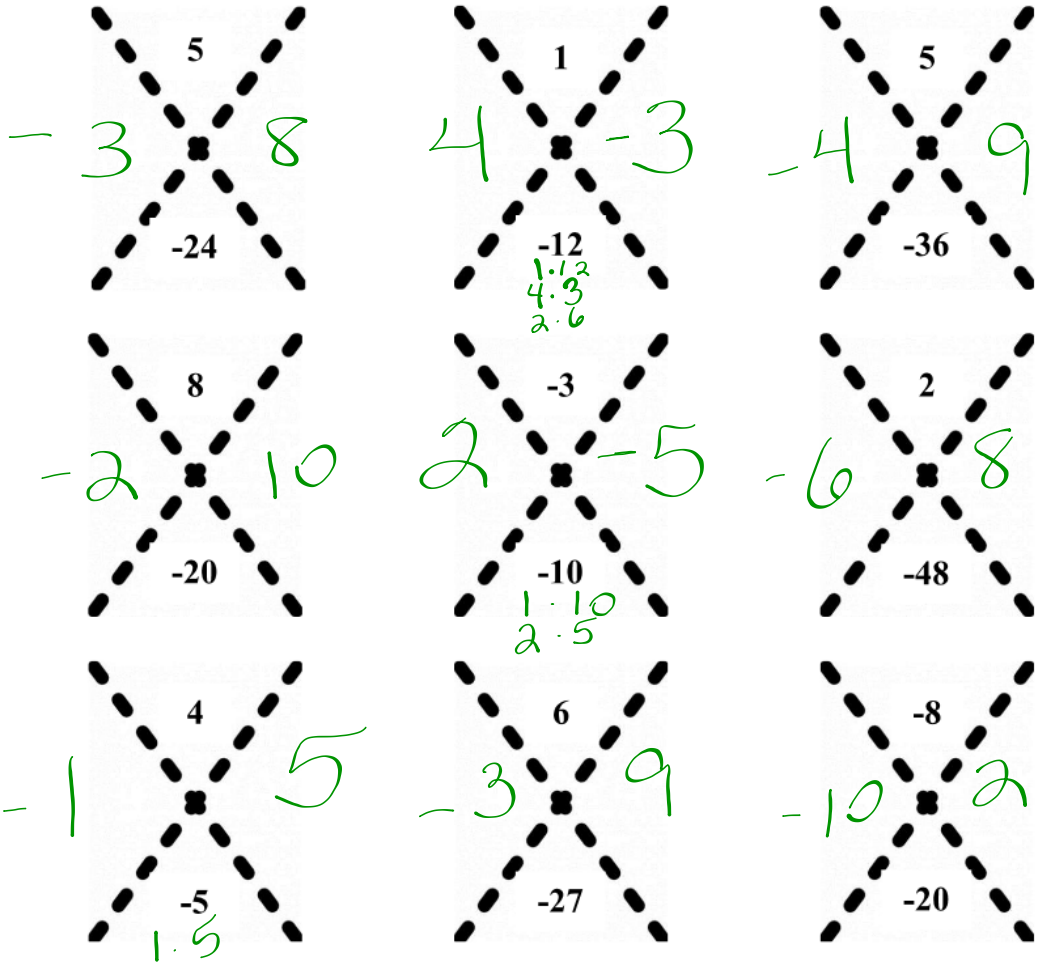
Algebra 1 Unit 7: Quadratic Expressions Notes

Day 7 – Factor Polynomials (-, -) & (+, -)

Directions: Complete the puzzles below like yesterday.



1, 36
2, 18
3, 12
6, 6
4, 9

1, 48
2, 24
3, 16
4, 12
6, 8

What types of patterns did you notice?

One negative number and one positive number (factors)

Review and Connect: Multiply the following binomials together.

a. $(x + 4)(x - 7)$ b. $(2x - 5)(x + 6)$ c. $(x + 6)(x - 6)$ d. $(3x - 7)(x + 1)$

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You probably noticed that the multiplying number was negative every time, but the adding number could be positive or negative, depending on which number got the negative sign. If the larger number had the negative sign, the adding number was negative and if the smaller number was negative, the adding number was positive.

$x^2 + bx - c = (\quad)(\quad)$

$x^2 - bx - c = (\quad)(\quad)$

Example 1: Factor $x^2 + 5x - 6$

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**.	$x^2 + 5x - 6$ → 1, 6; 2, 3 No GCF $x \cdot x$ $(x+2)(x+3) = 3x + 2x = 5x$ NO $(x-2)(x-3) = -3x - 2x = -5x$ NO $(x-1)(x+6) = 6x + -1x = 5x$ Yes! 5, -6

Example 2: Factor $x^2 - 16$

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**.	$x^2 - 16$ rewrite: $x^2 + 0x - 16$ No GCF 1·16; 2·8; 4·4 $(x-4)(x+4) = 4x - 4x = 0x$ No!

No GCF

$5x^2 - 31x - 28$

$5x, x$

1, 28
2, 14
4, 7

$(5x - 14)(x + 2) \Rightarrow 10x - 14x = -4x$ No!

$(5x + 7)(x - 4) - 20x + 7x = 13x$ NO!

$(5x + 4)(x - 7) - 35x + 4x = -31x$ ✓

GCF $\frac{9x^2}{3} + \frac{21x}{3} - \frac{60}{3}$

$3(3x^2 + 7x - 20)$

$3x \cdot x$