

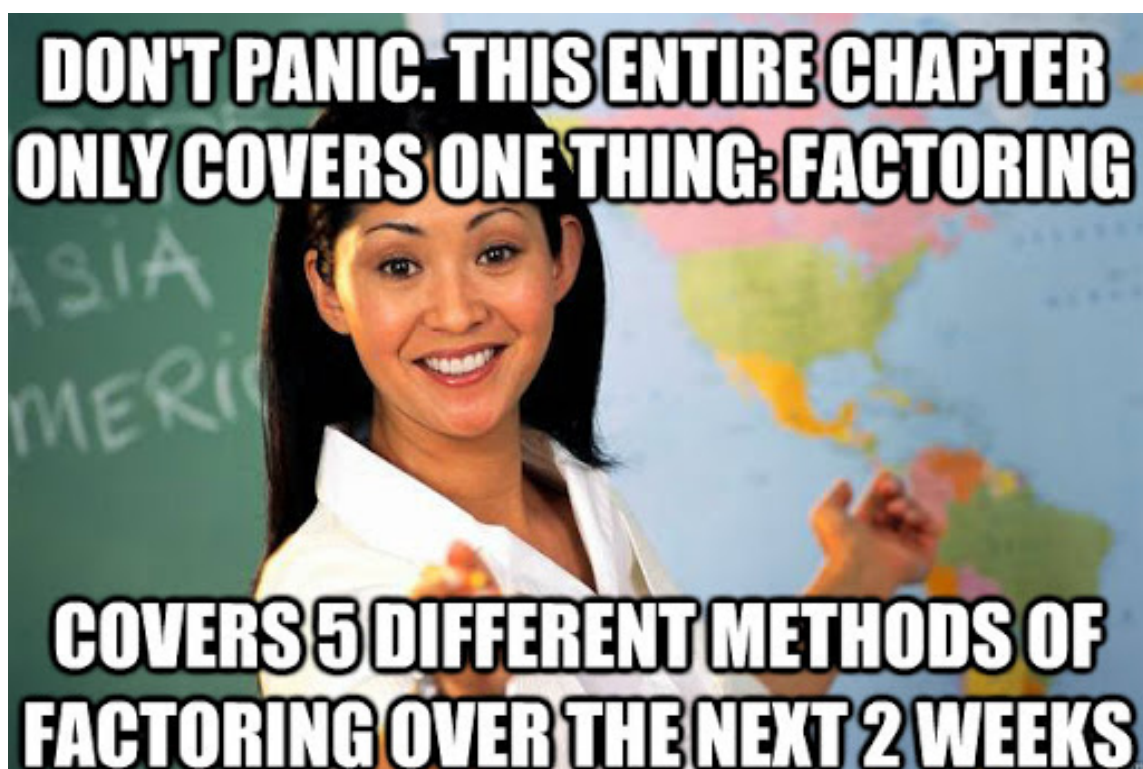
Good morning!

1. "Here"
2. Notes on Greatest Common Factor
3. Quiz on Friday

Unit 6: Quadratic Review

Factoring and Solving Methods

Monday	Tuesday	Wednesday	Thursday	Friday
26 GCF Factoring	27 Factor by Grouping	28 Delta Math	29 Factor $a=1$ and Special Cases	30 Review/Quiz
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Name: _____ Date: _____

GCF Factoring

Introduction to Factoring out GCF

★ "Factor" simply means to **UNDISTRIBUTE**. ★

multipliers

what do they share?

Distributed Version	Factored Version
$5x^2 + 15x$	$5x(x+3)$
$2x^3 - 8x^2$	$2x^2(x-4)$
$\frac{2x^2-4x}{2x} \quad \frac{2x^2-4x}{2x}$	$2x(x-2)$
$\frac{15x^2-5x+30}{5} \quad \frac{15x^2-5x+30}{5} \quad \frac{15x^2-5x+30}{5}$	$5(3x^2-x+6)$

More formal Definition:

⊙ **Factoring:** Writing the polynomial as a product.

Steps to Factoring Out a GCF:

- ★ Find the GCF of all its terms (number and/or variables). For variables ALL the terms must have the variable. Choose the smallest exponent!
- ★ The GCF goes to the LEFT!
- ★ Write the polynomial as a product by dividing the original terms of the polynomial by the GCF.
- ★ The remaining factors in each term will form a polynomial. You'll always have the same number of terms you started with.

Factor using a GCF:

<p>⊙ $\frac{4x+6y}{2} \quad \frac{4x+6y}{2}$</p> <p style="color: blue;">4: 2 (2) 6: 3 (2)</p> <p style="color: blue; font-size: 2em;">$2(2x+3y)$</p>	<p>⊙ $\frac{6x^3-9x^2+12x}{3x} \quad \frac{6x^3-9x^2+12x}{3x} \quad \frac{6x^3-9x^2+12x}{3x}$</p> <p style="color: green; font-size: 2em;">$3x(2x^2-3x+4)$</p>	<p>⊙ $\frac{y^8-y^5+y^2}{y^2} \quad \frac{y^8-y^5+y^2}{y^2} \quad \frac{y^8-y^5+y^2}{y^2}$</p> <p style="color: red; font-size: 2em;">$y^2(y^6-y^3+1)$</p>
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GCF Factoring

Greatest Common Factor: The largest number that divides evenly into a set of numbers.

When dealing with variables, it is the lowest degree of a variable common to every term.

Examples: Factor the GCF of each of the following:

1. $(8xy - 2y)$ $2y(4x - 1)$	2. $(27x^3 - 9x^2)$ $9x^2(3x - 1)$	3. $(42xy^5 + 7x^2)$ $7x(6y^5 + x)$	4. $(2x^2 - 12x)$ $2x(x - 6)$
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To factor the GCF out of an expression, divide each term by the GCF and write your answer in undistributed form.

10: 4:2
5: 4:1

Factor the GCF out of each of the following:

5. $\frac{10x^3}{5x} - \frac{5x}{5x}$ $5x(2x^2 - 1)$	6. $\frac{y^5}{y^2} + \frac{y^2}{y^2}$ $y^2(y^3 + 1)$	7. $\frac{27x}{9x} - \frac{81xy^2}{9x}$ $9x(\frac{3}{3} - \frac{9y^2}{3})$ $3 \cdot \frac{9}{3}x(1 - 3y^2)$	8. $\frac{10x}{2} - \frac{14y}{2} + \frac{40x^2}{2}$ $2(5x - 7y + 20x^2)$
9. $\frac{x^3y}{x^2y} - \frac{x^5yz^3}{x^2y} + \frac{x^2y^2}{x^2y}$ $x^2y(x - x^3z^3 + y)$	10. $\frac{17z^2}{17z} - \frac{68zy^2}{17z}$ $17z(z - 4y^2)$	11. $\frac{2x}{2} - \frac{16y}{2}$ $2(x - 8y)$	12. $\frac{5y}{5} + \frac{20y^2}{5} - \frac{125}{5}$ $5(y + 4y^2 - 25)$ $5(4y^2 + y - 25)$

$$\frac{27x}{27x} - \frac{81xy^2}{27x}$$
$$27x (1 - 3y^2)$$

$$\begin{array}{c} 27 \\ \swarrow \downarrow \searrow \\ 3 \quad 9 \\ \quad \swarrow \downarrow \searrow \\ \quad \quad 3 \quad 3 \\ \quad \quad \quad \swarrow \downarrow \searrow \\ \quad \quad \quad \quad 3 \quad 3 \end{array}$$
$$27 \text{ (} 3 \cdot 3 \cdot 3 \text{)}$$
$$3^3$$
$$\begin{array}{c} 81 \\ \swarrow \downarrow \searrow \\ 9 \quad 9 \\ \quad \swarrow \downarrow \searrow \\ \quad \quad 3 \quad 3 \quad 3 \quad 3 \\ \quad \quad \quad \swarrow \downarrow \searrow \\ \quad \quad \quad \quad 3 \quad 3 \end{array}$$
$$81 \text{ (} 3 \cdot 3 \cdot 3 \cdot 3 \text{)}$$
$$3^4$$



PRACTICE: Factor each polynomial using a GCF.

1. $10x + 45$

2. $28x - 63$

3. $18a + 42$

4. $8x + 24$

5. $18x^2 - 15x + 39$

6. $27a^2 + 81$

7. $72a^8 + 33a^5 - 42a^3$

8. $15x^7 + 30x^6 - 45x^3$

9. $4x^3 + 16x^2 - 44$

10. $14x^2 + 7x - 42$

Algebra 1
Factor GCF of a Polynomial

Quadratic Expressions

Practice

Name: _____

Practice Assignment

Date: _____ Block: _____

Review: Multiply the polynomials

a. $(x + 4)(x - 3)$

b. $(x + 8)^2$

c. $(2x + 4)(5x - 1)$

Factor the following polynomials.

1. $x^2 + 10x$

2. $x^2 - 9x$

3. $x^2 - 6x$

4. $3b^2 - 81b$

5. $10x^2 + 40x$

6. $8x^2 + 24x$

10. $-2x^2 - 4x$

11. $-30x^2 + 25x$

12. $-28x^2 - 14x$

MORE GCF FACTORING PRACTICE

When you factor an expression, you break each term down into its prime factors and expand the variables. The GCF of the terms goes on the outside of the expression and what is leftover goes in parenthesis after the GCF.

Practice: Factor each expression.

1. $x^2 + 5x$

2. $x^2 - 8x$

3. $x^2 - 3x$

4. $28x - 63$

5. $18x^2 - 6x$

6. $4x^2 - 4x$

7. $2m^2 - 8m$

8. $-9a^2 - a$

9. $35y^2 - 5y$

10. $6x^3 - 9x^2 + 12x$

11. $4x^3 + 6x^2 - 8x$

12. $15x^3y^2 + 10x^2y^4$