Warm – Up #1

What do you find in common with the following algebraic expression?

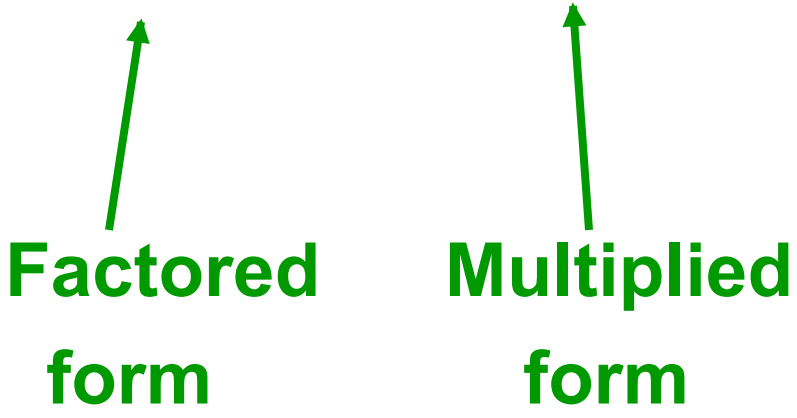
$$2xy^3 - 4x^2y$$

Factoring! What is it?

- Factoring – the process of undoing multiplication
- $(x + 2)(x + 3) = x^2 + 5x + 6$

Factoring

- $x(x - 6) = x^2 - 6x$



How do we factor? FACTOR may be a verb. It implies the action of undoing multiplication.

- Let's refer to the graphic organizer.
- We will start at the top.

First:

Find and remove the GCF

(greatest common factor)

Finding and removing the GCF

- What is the GCF of 12 and 15?
- What is the GCF of 5 and 20?

How do we find the GCF of variables?

Let's use prime factorization (factor trees)

- What is the GCF of x and x^2?
- What is the GCF of x^8 and x^5?
- What is the GCF of x^2y^4 and x^3?
- **Do you notice a shortcut?**

What is the GCF?

- $3x - 6$
- $2x + 12$
- $12x + 9$
- $x^2 - 6x$
- $4x^2 - 2x$
- $5x^3 - 15x^2$

Now let's FACTOR by finding and removing the GCF!

- Remove GCF and in parentheses write what is left
- 3x – 6 GCF = 3
- 3( ) What is left after 3 is removed?
- 3(x – 2)  Answer

Factor.

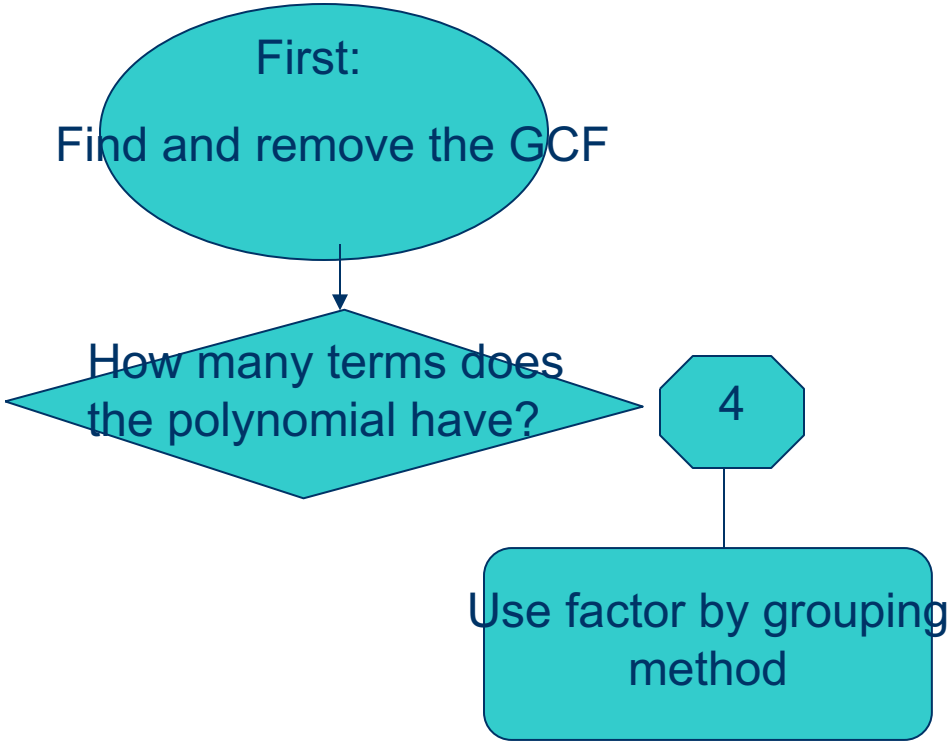
- $3x - 6$
- $2x + 12$
- $12x + 9$
- $x^2 - 6x$
- $4x^2 - 2x$
- $5x^3 - 15x^2$

Warm – Up #2

- Factor out the GCF in the following:

1. $3x + 18$
2. $7y^3 – 21y^2$
3. $12a^2 + 15a – 24$
4. $10x – 5$

Factoring by Grouping
Look at the graphic organizer!



Factoring by Grouping

- Group the first two (forms a binomial)
- Group the last two (forms a binomial).
- Now, Factor out the GCF!

Example:

$$5v^3 - 2v^2 + 25v - 10$$

Now you try!

- $2b^3 + b^2 + 8b + 4$

- $15x^3 - 25x^2 + 12x - 20$

Homework

Choose ANY 12!!

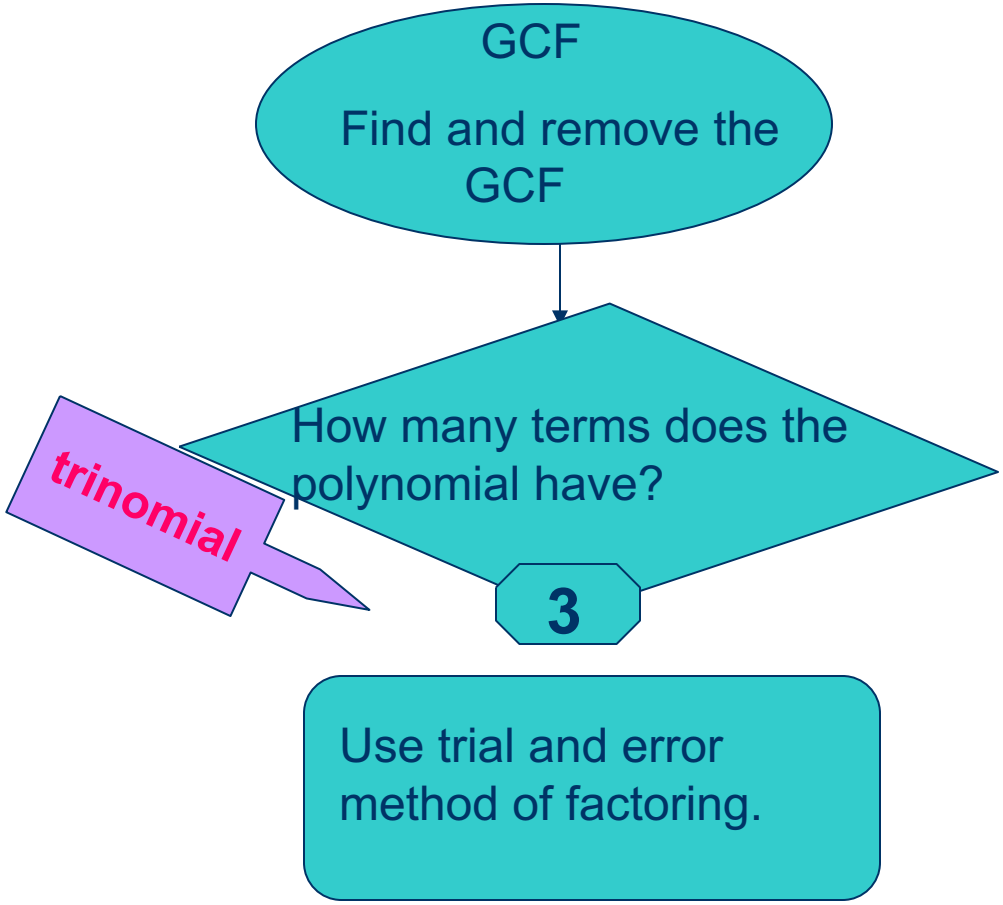
Warm-Up #3

- Factor by grouping with the following expressions:

1. $20p^3 + 5p^2 + 8p + 2$

2. $5x^3 + x^2 + 5x + 1$

Let's look at our graphic organizer



Now let's FACTOR TRINOMIALS!
3 terms

- Remember, we undo multiplying!
- $x^2 + 5x + 6$

1. **Is there a GCF?**
2. **$(x + 2)(x + 3)$**

To factor a trinomial, it breaks down into a product of binomials

Factoring Trinomials

- $x^2 + 5x + 6$

(x) (x) $x^2 = x \cdot x$

- What are the factors of 6?

1, 6 -1, -6 2, 3 -2, -3

- Which pair adds to be 5?

2, 3

- (x + 2)(x + 3)  Answer

Factor Trinomials

You try!

1. $x^2 + 7x + 12$

Factor Trinomials

- $x^2 + 12x + 20$
- $x^2 + 8x + 12$
- $x^2 + 6x + 9$

Factor Trinomials

- $x^2 - x - 12$

- $x^2 - 2x - 24$

Factor Trinomials

- $x^2 - 6x + 8$

- $x^2 - 11x + 24$

Homework

ALL #1 - #16

Warm – Up #4

- Factor out each trinomial:

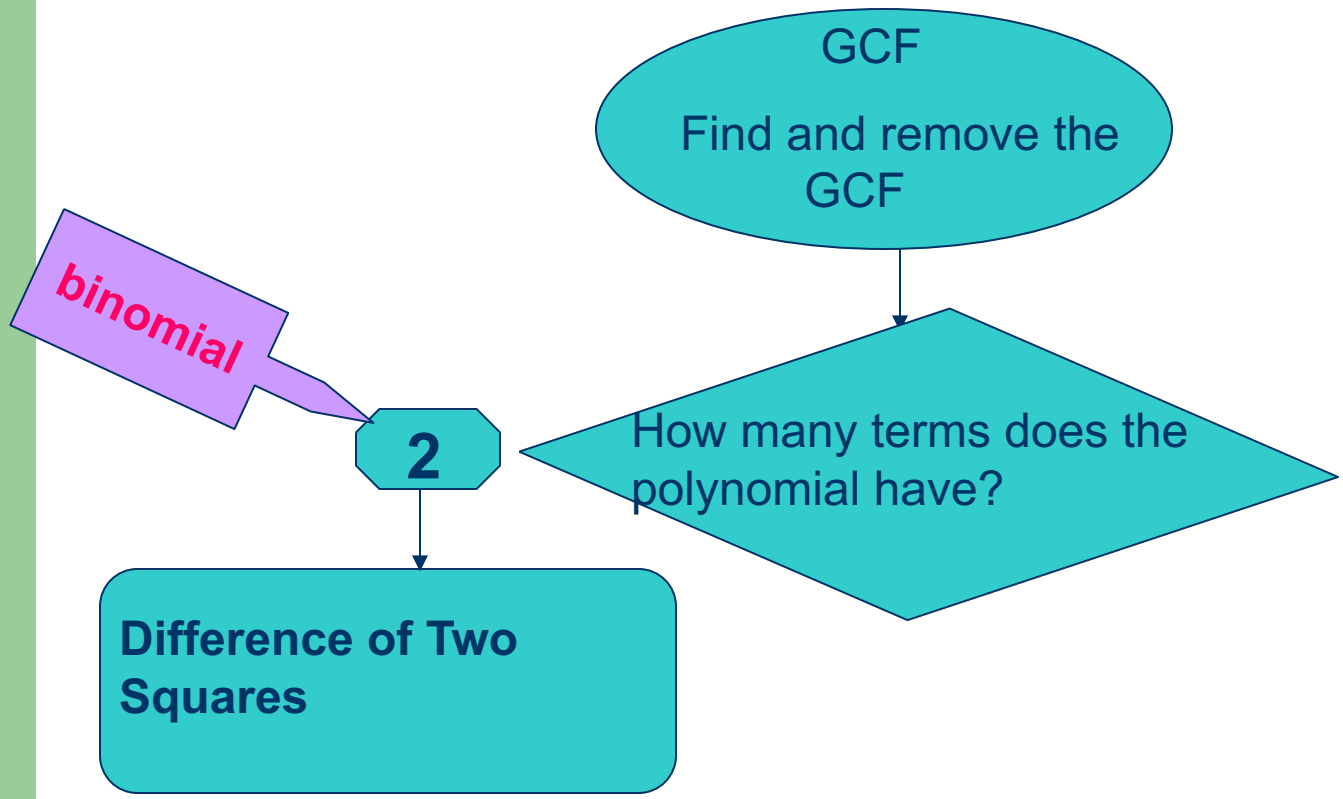
1. $n^2 + 4n - 12$

2. $n^2 - n - 56$

Review

Teach me how to Factor

Let's look at our graphic organizer



What's a Difference of Two Squares

- Must have 2 perfect squares
- Must have subtraction (difference)
- A variable is a perfect square if the exponent is an even number.

$$4x^2 - 81 \qquad and \qquad x^2 - 16$$

Differences of Two Squares

- IS IT A DTS?
- $X^2 + 25$
- $X^2 – 16$
- $X^5 – 81$
- $16x^2 – 100$
- $25x^4 – 16x$
- $X^2 + 10x + 25$

Factor. Use graphic organizer.

1. $x^2 - 16$
2. $x^2 - 100$

3. $4x^2 - 25$
4. $9 - y^2$
5. $2x^2 - 8$

Classwork

Complete Extra Practice

Homework

ALL #1 - #16