

Notes Week 10 – Week 12 (10/09 – 10/29)

Lesson One: Trinomials with a GCF

Lesson Two: Trinomials with a Leading Coefficient (Slide, Divide, Bottoms up)

Lesson Three: Trinomials with a Leading Coefficient Continued

Lesson Four: Ch. One Test Review

Lesson Five: Analyzing Quadratic Functions

Lesson Six: Graphing Quadratic Functions Intro.

Lesson One:

10/09/2020 Factoring Trinomials w/a GCF

- I can factor polynomials

Warm-up

① Factor

$$x^2 + 10x + 24$$

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

① GCF

② X-method

$$\begin{array}{r} 24 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} \text{Last} \leftarrow \text{multiply} \\ \text{Magic} \# \quad \text{Magic} \# \\ \text{Middle} \# \\ \hline \text{add} \end{array}$$

$$\begin{array}{l} 24 \\ 1 \cdot 24 \\ 2 \cdot 12 \\ 3 \cdot 8 \\ 4 \cdot 6 = 24 \\ 4 + 6 = 10 \end{array}$$

Trinomials with a GCF

Examples:

①

$$2x^2 + 12x + 16$$

$$2(x^2 + 6x + 8)$$

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

$$\begin{array}{r} 2x^2 \mid 2 \quad x \cdot x \\ 12x \mid 2 \quad x \\ 16 \mid 2 \end{array}$$

$$\begin{array}{r} 8 \\ 2 \quad 4 \\ \times 6 \end{array}$$

$$\begin{array}{l} 8 \\ 1 \cdot 8 \\ 2 \cdot 4 = 8 \\ 2 + 4 = 6 \end{array}$$

②

$$3x^2 - 6x - 9$$

$$3(x^2 - 2x - 3)$$

$$3(x+1)(x-3)$$

$$\begin{array}{r} 3x^2 \mid 3 \quad x \cdot x \\ 6x \mid 3 \quad x \\ 9 \mid 3 \end{array}$$

$$\begin{array}{r} -3 \\ 1 \quad -3 \\ \times -2 \end{array}$$

$$\begin{array}{l} -3 \\ 1 \cdot -3 = -3 \\ 1 + -3 = -2 \end{array}$$

③

$$4x^2 + 20x + 16$$

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

$$4(x+1)(x+4)$$

$$\begin{array}{r} 4x^2 \mid 4 \quad x \cdot x \\ 20x \mid 4 \quad x \\ 16 \mid 4 \end{array}$$

$$\begin{array}{r} 4 \\ 1 \quad 4 \\ \times 5 \end{array}$$

$$\begin{array}{l} 4 \\ 1 \cdot 4 = 4 \\ 1 + 4 = 5 \end{array}$$

Lesson Two:

10/13/2020 Trinomials w/a Leading Coefficient.

- I can factor trinomials containing a leading coefficient $\neq 1$.

Steps: ① check for GCF
② use x-method

Warm-up

①

$$a^2 + 13a + 40$$

$$(a+5)(a+8)$$

$$5 \cdot 8 = 40$$

$$5 + 8 = 13$$

$$\begin{array}{c} 40 \\ 5 \times 8 \\ 13 \end{array}$$

②

$$b^2 + 9b + 14$$

$$(b+2)(b+7)$$

$$2 \cdot 7 = 14$$

$$2 + 7 = 9$$

$$\begin{array}{c} 14 \\ 2 \times 7 \\ 9 \end{array}$$

③

$$2x^2 + 14x + 20$$

$$2(x^2 + 7x + 10)$$

$$2(x+5)(x+2)$$

$$\begin{array}{c|c|c} 2x^2 & 2 & x \times \\ \hline 14x & 2 & x \\ \hline 20 & 2 & \end{array}$$

$$\begin{array}{c} 10 \\ 5 \times 2 \\ 7 \end{array}$$

Trinomials with Leading Coefficients

- Use slide, divide, bottoms-up

Example

①

$$2v^2 + 11v + 5$$

$$v^2 + 11v + 10$$

$$(v+1)(v+10)$$

$$(2v+1)(v+5)$$

$$\begin{array}{c|c} 2v^2 & \text{fact} \\ \hline 11v & \\ \hline 5 & \end{array}$$

$$\begin{array}{c} 10 \text{ Mult.} \\ 1 \times 10 \\ 11 \text{ add} \end{array}$$

$$\begin{array}{c|c} 4v^2 & \text{GCF} \\ \hline 17v & \\ \hline 4 & \end{array}$$

$$\begin{array}{c} 16 \\ 1 \times 16 \\ 17 \end{array}$$

$$(4v+1)(v+4)$$

③

$$4n^2 + 17n + 4$$

$$n^2 + 17n + 16$$

$$(n+1)(n+16)$$

$$\begin{array}{c} 16 \\ 1 \times 16 \\ 17 \end{array}$$

$$(4n+1)(n+4)$$

②

$$2n^2 + 5n + 2$$

$$n^2 + 5n + 4$$

$$\begin{array}{c} \text{Bottom op} \quad (n+1)(n+4) \quad \text{Divide} \\ \hline (2n+1)(n+2) \end{array}$$

④

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

$$x^2 - 8x + 12$$

$$(x-6)(x-2)$$

$$(x-3)(3x-2)$$

$$\begin{array}{c|c} 2n^2 & \text{GCF} \\ \hline 5n & \\ \hline 2 & \end{array}$$

$$\begin{array}{c} 4 \\ 1 \times 4 \\ 5 \end{array}$$

Lesson Three:

10/15/2020 Factoring Trinomials w/ Leading Coefficient

• I can factor polynomials

Warm-up

① $3x^2 + 9x + 6$
 $3(x^2 + 3x + 2)$
 $3(x+1)(x+2)$

$$\begin{array}{c|cc} 3x^2 & 9x & 6 \\ \hline 3 & 3 & 2 \end{array}$$

$$\begin{array}{c} 2 \\ \times 3 \\ \hline 6 \end{array}$$

steps:

- ① GCF
- ② X-method
- ③ slide, divide, bottoms up

② $2n^2 + 3n - 9$
 $n^2 + 3n - 18$
 $(n+6)(n-3)$
 $(n+3)(2n-3)$

$$\begin{array}{c|cc} 2n^2 & 3n & -9 \\ \hline 2 & 3 & -9 \end{array}$$

$$\begin{array}{c} 18 \\ \times 3 \\ \hline 54 \end{array}$$

$(n+3)(2n-3)$

Guided Practice

① $5a^2 + 19a + 12$
 $a^2 + 19a + 60$
 $(a+4)(a+15)$

$$\begin{array}{c|cc} 5a^2 & 19a & 12 \\ \hline 5 & 19 & 12 \end{array}$$

$$\begin{array}{c} 60 \\ \times 15 \\ \hline 900 \end{array}$$

$(5a+4)(a+3)$

② $2b^2 - 12b + 10$
 $2(b^2 - 6b + 5)$
 $2(b-5)(b-1)$

$$\begin{array}{c|cc} 2b^2 & -12b & 10 \\ \hline 2 & -12 & 10 \end{array}$$

$$\begin{array}{c} 10 \\ \times 5 \\ \hline 50 \end{array}$$

③ $6n^2 + 5n - 6$
 $n^2 + 5n - 36$
 $(n-4)(n+9)$
 $(3n-2)(2n+3)$

④ $4x^2 + 15x - 25$
 $x^2 + 15x - 100$
 $(x-5)(x+20)$
 $(4x-5)(x+5)$

Lesson Four:

Chapter 1 Test Review

I can find the GCF

① $3x + 9$
 $\boxed{3}$

$$\begin{array}{r|l} 3x & 3x \\ 9 & 9 \end{array} \quad \begin{array}{l} \text{3} \\ \text{3} \end{array} \quad x$$

② $x^2 + x^5$
 $\boxed{x^2}$ x to the power of 2

$$\begin{array}{r|l} x^2 & x^2 \\ x^5 & x^5 \end{array} \quad \begin{array}{l} x \\ x \end{array} \quad \begin{array}{l} x \\ x \end{array} \quad x \quad x \quad x$$

I can factor by grouping

③ $3x^2 + 6x + 2x + 4$
 $\therefore (3x^2 + 6x) + (2x + 4)$
 $\textcircled{3x}(x + 2) + \textcircled{2}(x + 2)$
 $\boxed{(3x + 2)(x + 2)}$

$$\begin{array}{r|l} 3x^2 & 3x^2 \\ 6x & 6x \end{array} \quad \begin{array}{l} \text{3} \\ \text{3} \end{array} \quad \begin{array}{l} x \\ x \end{array} \quad x$$

$$\begin{array}{r|l} 2x & 2x \\ 4 & 4 \end{array} \quad \begin{array}{l} \text{2} \\ \text{2} \end{array} \quad x$$

④ $4x^2 + 8x - 5x + 10$
 $\therefore (4x^2 + 8x) - (5x + 10)$
 $\textcircled{4x}(x + 2) - \textcircled{5}(x + 2)$
 $\boxed{(4x - 5)(x + 2)}$

$$\begin{array}{r|l} 4x^2 & 4x^2 \\ 8x & 8x \end{array} \quad \begin{array}{l} \text{4} \\ \text{4} \end{array} \quad \begin{array}{l} x \\ x \end{array} \quad x$$

$$\begin{array}{r|l} 5x & 5x \\ 10 & 10 \end{array} \quad \begin{array}{l} \text{5} \\ \text{5} \end{array} \quad x$$

I can factor trinomials

⑤ $x^2 + 11x + 10$
 $\boxed{(x + 1)(x + 10)}$

$$\begin{array}{r} 10 \\ \times 10 \\ \hline 11 \end{array} \quad \begin{array}{l} \text{multiply} \\ \text{add} \end{array}$$

Steps:

- ① check GCF
- ② X method

• I can factor trinomials

⑥ $2x^2 + 8x + 6$

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

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

steps:

- ① GCF
- ② X method
- ③ slide, divide Bottoms up

multiply

add

⑦ $3x^2 + 7x + 4$

$x^2 + 7x + 12$

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

$(x+1)(3x+4)$

slide multiply

add

slide divide Bottoms-up

* Divide by the number we slide *

Factoring Trinomials with a Leading Coefficient

⑧ $3p^2 - 2p - 5$

$(p^2 - 2p - 15)$

$(p+3)(p-5)$

$(p+1)(3p-5)$

slide multiply

slide divide Bottoms-up

multiply

add

multiply

add

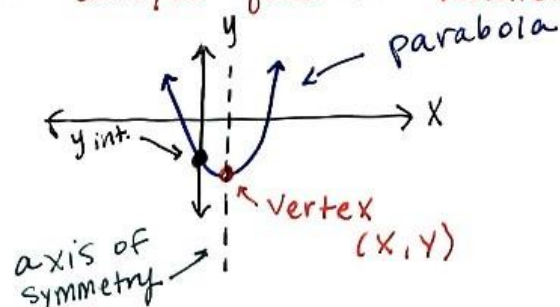
multiply

add

Lesson Five:

10/27/2020 Quadratic Functions

- I can analyze quadratic functions



Standard Form : $y = ax^2 + bx + c$

Axis of Symmetry : $x = -\frac{b}{2(a)}$

y intercept : c

Vertex : $(-\frac{b}{2(a)}, \text{ Plug in my } x)$

Example 3

Axis of Symmetry
 $x = -1$

y intercept :
 -4

Vertex :
 $(-1, -7)$

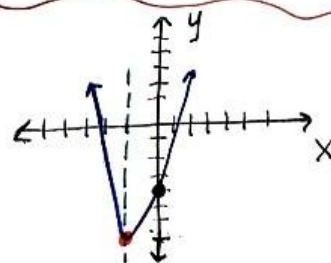
$$y = 3x^2 + 6x - 4$$

$a = 3$ $b = 6$ $c = -4$

$$x = -\frac{6}{2(3)}$$

$$x = -\frac{6}{6}$$

$$x = -1$$



Vertex :

$$y = 3(-1)^2 + 6(-1) - 4$$

$$y = 3(1) + 6(-1) - 4$$

$$y = 3 - 6 - 4$$

$$y = -3 - 4$$

$$y = -7$$

Lesson Six:

10/29/20 Graph Quadratic Functions

- I can graph quadratic functions

Standard form: $ax^2 + bx + c$

Axis of symmetry: $x = -\frac{b}{2a}$

y intercept: c

Vertex: $(-\frac{b}{2a}, \text{Plug in our } x)$

Example 1
Graph

Axis of Symm.

$$x = -1$$

y intercept:
-2

Vertex:
 $(-1, -5)$

$$y = 3x^2 + 6x - 2$$

$a = 3$ $b = 6$ $c = -2$

$$x = -\frac{6}{2(3)}$$

$$x = -\frac{6}{6}$$

$$x = -1$$

$$y = 3x^2 + 6x - 2$$

$$y = 3(-1)^2 + 6(-1) - 2$$

$$y = 3(1) + 6(-1) - 2$$

$$y = 3 - 6 - 2$$

$$y = -5$$

