

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

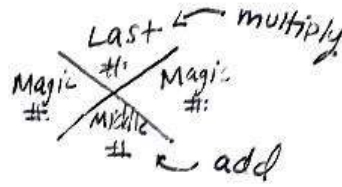
Warm-up
① Factor

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

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

① GCF
② X-method

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



- 24
- 1 · 24
- 2 · 12
- 3 · 8
- 4 · 6 = 24
- 4 + 6 = 10

Trinomials with a GCF

Examples:

①

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

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

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

$$\begin{array}{r|l} 2x^2 & 2 \\ \hline 12x & 6 \\ 16 & 8 \end{array} \begin{array}{l} x \\ x \\ x \end{array}$$

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

$$8$$

$$1 \cdot 8$$

$$2 + 4 = 6$$

②

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

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

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

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

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

$$-3$$

$$1 \cdot -3 = -3$$

$$1 + -3 = -2$$

③

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

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

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

$$\begin{array}{r|l} 4x^2 & 4 \\ \hline 20x & 5 \\ 16 & 4 \end{array} \begin{array}{l} x \\ x \\ x \end{array}$$

$$\begin{array}{r} 4 \\ \times 4 \\ \hline 1 \end{array}$$

$$4$$

$$1 \cdot 4 = 4$$

$$1 + 4 = 5$$

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 $a^2 + 13a + 40$
 $(a+5)(a+8)$

$5 \cdot 8 = 40$
 $5 + 8 = 13$

40
5 8
13

② $b^2 + 9b + 14$
 $(b+2)(b+7)$

$2 \cdot 7 = 14$
 $2 + 7 = 9$

14
2 7
9

③ $2x^2 + 14x + 20$
 $2(x^2 + 7x + 10)$
 $2(x+5)(x+2)$

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

$5 \cdot 2 = 10$
 $5 - 7 = -2$

Trinomials with Leading Coefficients

- Use slide, divide, bottoms-up

Example

① $2v^2 + 11v + 5$
 $v^2 + 11v + 10$
 $(v+1)(v+10)$
 $(2v+1)(v+5)$

$2v^2$ | $11v$ | 5 | fact
 5 | 10 | 10 | Mult.
~~1~~ ~~10~~
11 | add

③ $4n^2 + 17n + 4$
 $n^2 + 17n + 16$
 $(n+1)(n+16)$
 $(4n+4)(n+4)$

$4n^2$ | $17n$ | 4 | GCF
 4 | 16 | 16 | GCF
~~1~~ ~~16~~
17 | add
 $(4n+4)(n+4)$

② $2n^2 + 5n + 2$
 $n^2 + 5n + 4$
Bottoms up $(n+1)(n+4)$ Divide
 $(2n+1)(n+2)$

$2n^2$ | $5n$ | 2 | GCF
 2 | 4 | 4 | GCF
~~1~~ ~~4~~
5 | add

④ $3x^2 - 8x + 4$
 $x^2 - 8x + 12$
 $(x-6)(x-2)$
 $(x-3)(3x-2)$

Lesson Three:

10/15/2020 Factoring Trinomials w/Leading Coefficient

• I can factor polynomials

Warm-up

① $3x^2 + 9x + 6$
 $3(x^2 + 3x + 2)$

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

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

$\frac{2}{3}$
 $\frac{1}{2}$

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

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

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

$2n^2$	$ $	9	GCF
$3n$	$ $	18	
9	$ $	18	

$\frac{-18}{3} = -6$
 $\frac{-3}{3} = -1$

Guided Practice

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

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

$5a^2$	$ $	12	GCF
$19a$	$ $	60	
12	$ $	60	

$\frac{60}{19}$
 $\frac{15}{4}$

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

$(n-\frac{2}{3})(n+\frac{3}{2})$

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

$6n^2$	$ $	36	GCF
$5n$	$ $	180	
6	$ $	180	

$\frac{-36}{5}$
 $\frac{-9}{4}$

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

$2b^2$	$ $	10	b	b
$-12a$	$ $	10	b	
10	$ $	10		

$\frac{5}{-5}$
 $\frac{-1}{-6}$

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

$\frac{-100}{15}$
 $\frac{-20}{5}$

$(4x-5)(x+5)$

Lesson Four:

Chapter 1 Test Review

• I can find the GCF

① $3x + 9$
 $\boxed{3}$

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

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

$$\begin{array}{r|ll} x^2 & x & x \\ \hline x^5 & x & x \end{array} x \ x \ x$$

• I can factor by grouping

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

$$\begin{array}{r|ll} 3x^2 & 3 & x \\ \hline 6x & 3 & x \end{array} x$$

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

$$\boxed{(3x+2)(x+2)}$$

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

$$\begin{array}{r|ll} 4x^2 & 4 & x \\ \hline 8x & 4 & x \end{array} x$$

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

$$\boxed{(4x-5)(x+2)}$$

• I can factor trinomials

⑤ $x^2 + 11x + 10$
 $\begin{array}{r} 0 \\ \cdot 10 \\ + 10 \end{array}$
 $\boxed{(x+1)(x+10)}$

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

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

$2x^2$	$2x$	x
$8x$	$2x$	x
6	2	

multiply
 1×3
 4 add

⑦ $3x^2 + 7x + 4$

$x^2 + 7x + 12$

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

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

slide multiply
 slide divide Bottoms-up

$3x^2$	
$7x$	
4	

multiply
 3×12
 7 add

* 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

$3p^2$	
$-2p$	
-5	

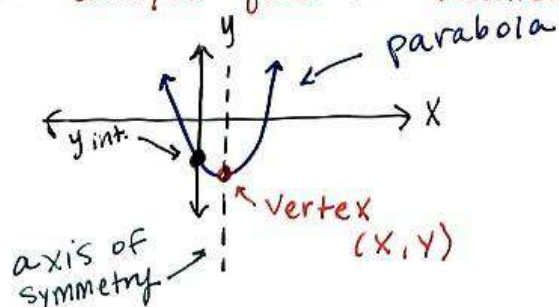
multiply
 3×-15
 -2 add

	-15
3	$-5 = -15$
3	$+ (-5) = -2$

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

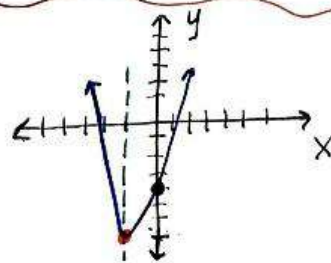
Vertex :
 $(-1, -7)$

$y = 3x^2 + 6x - 4$
 $a = 3 \quad b = 6 \quad c = -4$

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

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

$x = -1$



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 :
 $(-1, -5)$

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

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

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

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

$$x = -1$$

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

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

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

$$y = 3 - 6 - 2$$

$$y = -5$$

