Notes Weeks 7 – 9:

Lesson One: Test Review

Lesson Two: Factor Flow Chart

Lesson Three: GCF- Factor Completely

Lesson Four: Factor By Grouping

Lesson Five: Factoring Trinomials Introduction

Lesson Six: More Factoring Trinomials Practice

Lesson One

Test (part one) Review

Multiplying Polynomials

① #7

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

	$6x$	$+2$
$2x$	$12x^2$	$4x$
$+8$	$48x$	16

* Multiply
* write out answers
* combine like terms

$12x^2+4x+48x+16$

$\boxed{12x^2+52x+16}$

② #9

$(5x+6)(8x-4)$

	$5x$	$+6$
$8x$	$40x^2$	$48x$
-4	$-20x$	-24

$40x^2+48x-20x-24$

$\boxed{40x^2+28x-24}$

③ #21

$(7r^2-6r-6)(2r-4)$

$r \cdot r$

r^2

	$7r^2$	$-6r$	-6
$2r$	$14r^3$	$-12r^2$	$-12r$
-4	$-28r^2$	$24r$	24

$14r^3-12r^2-12r-28r^2+24r+24$

$\boxed{14r^3-40r^2+12r+24}$

Greatest Common Factor (GCF)

- Factor out the GCF

① #2

$-6r^5-6r^4$

$-6r^5$	2	3	6	r	r	r	r	r
$-6r^4$	2	3	6	r	r	r	r	

$\boxed{GCF: -6r^4}$

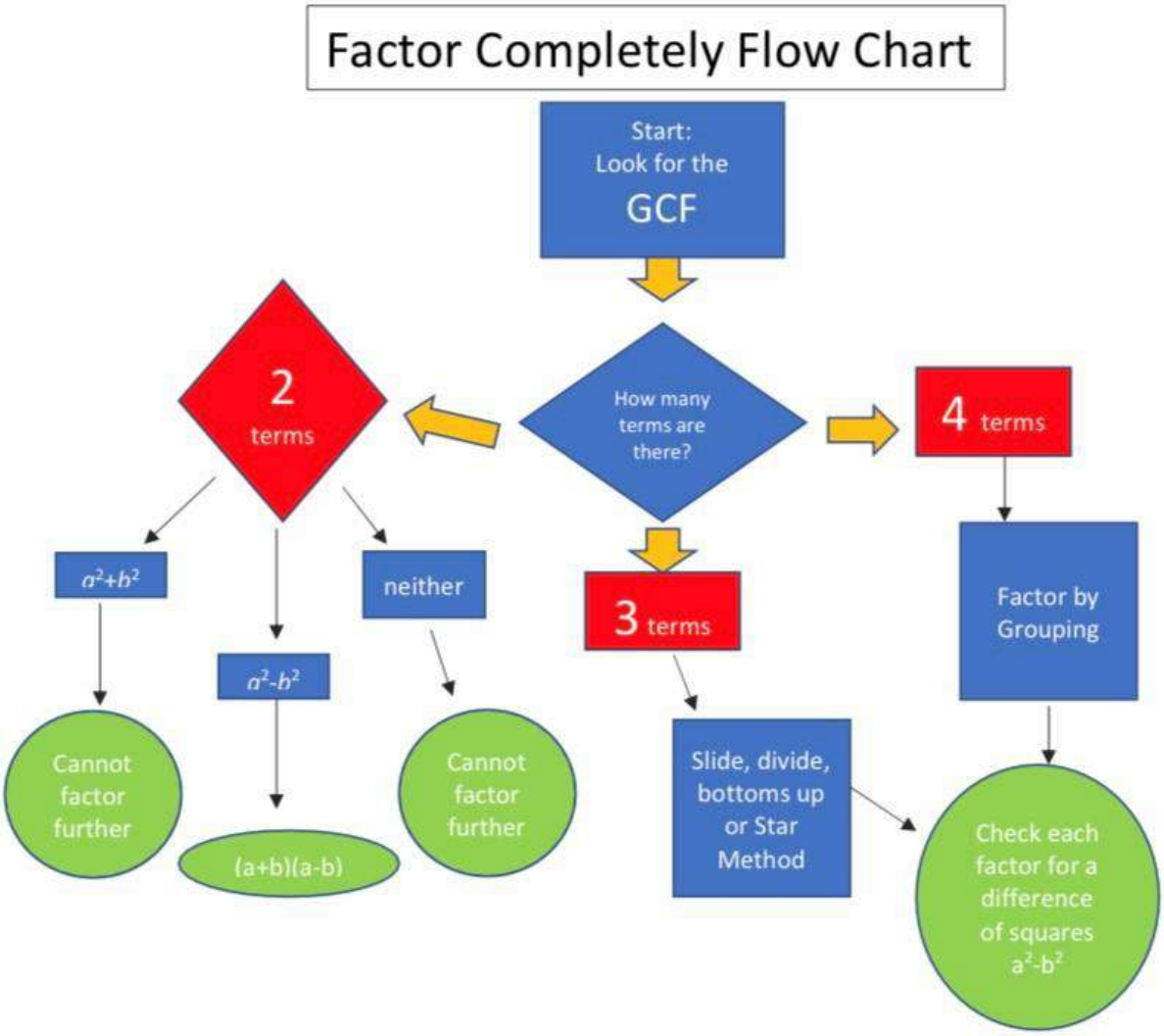
② #3

$-28v^2-8v-36$

$-8v$	2	4	8, v
$-28v^2$	2	4	v, v
-36	2	4	

$\boxed{GCF: 4}$

Lesson Two


Factor Completely Flow Chart
Start: Look for the GCF
How many terms are there?
2 terms
3 terms
4 terms
a^2+b^2
a^2-b^2
neither
Cannot factor further
(a+b)(a-b)
Cannot factor further
Slide, divide, bottoms up or Star Method
Factor by Grouping
Check each factor for a difference of squares a^2-b^2

Lesson Three:

09/29/2020 GCF: Factor Completely

- I can factor out the greatest common factor and write what is remaining.

* Use the GCF chart posted in google classroom *

Helpful tip: After you take out the GCF, divide what you started with by the GCF to find what to write next.

Examples:

① $3x^2 + 9$ ÷ 3 → $3(1x^2+3)$

$3x^2$	3 x x
9	3

② $10x^2 + 25x$ ÷ 5x → $5x(2x+5)$

$10x^2$	5 x x
25x	5 x

③ $4x^2 - 16$ ÷ 4 → $4(x^2-4)$ → $4(x+2)(x-2)$

$4x^2$	4 x x
-16	4

④ $11x^2 - 33x$ ÷ 11x → $11x(x-3)$

$11x^2$	11 x x
-33x	11 x

⑤ $10x^2 + 15x - 50$ ÷ 5 → $5(2x^2+3x-10)$

$10x^2$	5 x x
15x	5 x
-50	5

⑥ $3x^2 - 27$ ÷ 3 → $3(x^2-9)$ → $3(x+3)(x-3)$

$3x^2$	3 x x
-27	3

Guided Practice

① $10x^2 + 20$ ÷ 10 → $10(x^2+2)$

$10x^2$	10 x x
20	10

② $12x^2 - 24x$ ÷ 12x → $12x(x-2)$

$12x^2$	12 x x
-24x	12 x

③ $4x^2 - 36$ ÷ 4 → $4(x^2-9)$ → $4(x+3)(x-3)$

$4x^2$	4 x x
-36	4

④ $7x^2 + 14x - 21$ ÷ 7 → $7(x^2+2x-3)$

$7x^2$	7 x x
14x	7 x
21	7

$\frac{a^4 + 5a^3}{a^3(a+5)}$ ÷ a^3a^4

a^3a^4	a a a a a
$5a^3$	5 a a a

Lesson Four

10/01/2020 Factor by Grouping

- I can factor polynomials by grouping

Warm-up

① $2x^2+8x$ ÷ 2x

$2x^2 = 2 \cdot x \cdot x$, $8x = 2 \cdot 2 \cdot x$

$2x(1x+4)$

② $5x+10$ ÷ 5

$5x = 5 \cdot x$, $10 = 2 \cdot 5$

$5(1x+2)$

③ $6x^2-9$ ÷ 3

$6x^2 = 3 \cdot x \cdot x$, $-9 = -3 \cdot 3$

$3(2x^2-3)$

④ $2x^2-4x+8$ ÷ 2

$2x^2 = 2 \cdot x \cdot x$, $-4x = -2 \cdot 2 \cdot x$, $8 = 2 \cdot 2 \cdot 2$

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

Factor by Grouping

* Use Factor Flow Chart
* use GCF chart

$5n^3 = 5 \cdot n \cdot n \cdot n$, $-10n^2 = -5 \cdot 2 \cdot n \cdot n$

$3n = 3 \cdot n$, $-6 = -2 \cdot 3$

Examples:

① $(12n^3+4n^2)(+3n+1)$

$12n^3 = 4 \cdot n \cdot n \cdot n$, $4n^2 = 4 \cdot n \cdot n$

÷ $4n^2$

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

$3n = 3 \cdot n$, $1 = 1 \cdot 1$

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

② $(5n^3-10n^2)(+3n-6)$

$5n^2(n-2)+3(n-2)$

$(5n^2+3)(n-2)$

③ $(12xy-28x)(-15y+35)$

$12xy = 4 \cdot x \cdot y$, $-28x = -4 \cdot 7 \cdot x$

$4x(3y-7)-5(3y-7)$

$-15y = -5 \cdot 3 \cdot y$, $35 = -5 \cdot -7$

$(4x-5)(3y-7)$

④ $(16x^2c+8xyd)(-16x^2d-8xyc)$

$8x(2xc+yd)-8x(2xd+4c)$

Cannot factor

Guided Practice

① $(2x^2+4x)(+3x+6)$

$2x^2 = 2 \cdot x \cdot x$, $4x = 2 \cdot 2 \cdot x$

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

$3x = 3 \cdot x$, $6 = 2 \cdot 3$

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

② $(5x^3-7x^2)(+10x-14)$

$x^2(5x-7)+2(5x-7)$

$(x^2+2)(5x-7)$

$5x^3 = 1 \cdot x \cdot x \cdot x$, $-7x^2 = -7 \cdot 1 \cdot x \cdot x$

$10x = 2 \cdot 5 \cdot x$, $-14 = -2 \cdot 7$

Lesson Five:

10/06/2020 Factoring Trinomials Introduction

Warm-up: Factor by grouping

#3

① $3n^3 - 4n^2 + 9n - 12$

$(3n^3 - 4n^2) + (9n - 12)$

$n^2(3n - 4) + 3(3n - 4)$

$(n^2 + 3)(3n - 4)$

$3n^3$: $1 \cdot n \cdot n \cdot n$; $-4n^2$: $1 \cdot n \cdot n$

$9n$: $3 \cdot n$; -12: 3

#7

② $35xy - 5x - 56y + 8$

$(35xy - 5x) - (56y + 8)$

$5x(7y - 1) - 8(7y - 1)$

$(5x - 8)(7y - 1)$

$35xy$: $5 \cdot x \cdot y$; $-5x$: $5 \cdot x$

$56y$: $8 \cdot y$; 8: 8

Factoring Trinomials (3 terms)

- I can simplify polynomials

① Take out GCF, write what's left

② Choose two numbers that multiply to equal the last term and that add to equal the middle term.

Examples:

① $n^2 - 11n + 10$ (add / multiply)

multiply: 10; add: -1, -10; -11

10: $1 \cdot 10 = 10$; $\hookrightarrow 1 + 10 = 11$

$(n - 1)(n - 10)$

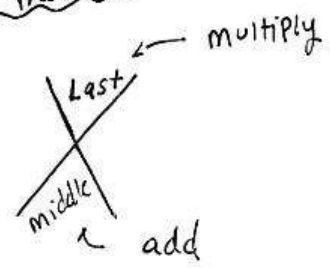
② $n^2 + 4n - 12$ (Bottom / Top)

multiply: -12; add: -2, 6; 4

-12: -1, 12; $-2 + 6 = 4$; 3, 4

$(n - 2)(n + 6)$

Star / X method

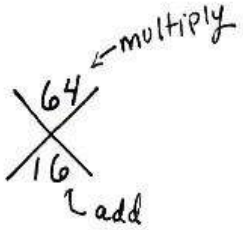


Steps
1. Check for GCF
2. Star / X method

Guided practice

1. $b^2 + 16b + 64$

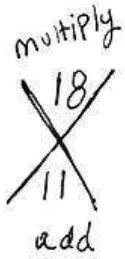
$\boxed{(b+8)(b+8)}$



16
1 + 15
2 + 14
3 + 13
4 + 12
5 + 11
6 + 10
7 + 9
* 8 + 8 = 16
↳ 8 · 8 = 64

2. $a^2 + 11a + 18$

$\boxed{(a+2)(a+9)}$



11 (add)
1 + 10
* 2 + 9 = 11
↳ 2 · 9 = 18

	a	+2
a	a^2	2a
+9	9a	18

$a^2 + 2a + 9a + 18$

$a^2 + 11a + 18$

Lesson Six

10/08/20 Factoring Trinomials Continued

- I Can factor polynomials

Warm-up

Factor by grouping:

① $20n^3 + 12n^2 + 25n + 15$

$(20n^3 + 12n^2) + (25n + 15)$

$4n^2(5n + 3) + 5(5n + 3)$

$(4n^2 + 5)(5n + 3)$

$20n^3$	4	n	n	n
$12n^2$	4	n	n	

$25n$	5	n
15	5	

② $2x^3 + x^2 + 8x + 4$

$(2x^3 + x^2) + (8x + 4)$

$x^2(2x+1) + 4(2x+1)$

$(x^2+4)(2x+1)$

$2x^3$	1	x	x	x
x^2	1	x	x	

$8x$	4	x
4	4	

Factor this trinomial:

③ $x^2 + 9x + 20$

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

20

$4 \quad 5$

9

① Check for GCF

② X-method

20

$1 \cdot 20$

$2 \cdot 10$

$4 \cdot 5 = 20$

$4 + 5 = 9$

Quick Questions?

① What number goes on top of my X?

② What number goes on bottom of my X?

③ How can I check my work?

10/08/2020 Factoring Trinomials Continued

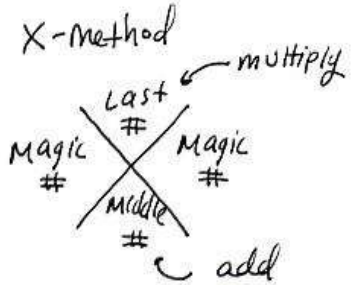
- I can factor polynomials

steps:

① Check for GCF

② X-method

X-method

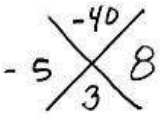


Guided Practice

- Factoring Trinomials

① $b^2 + 3b - 40$

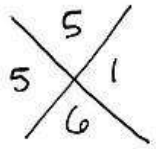
$(b-5)(b+8)$



-40
$1 \cdot 40$
$2 \cdot 20$
$4 \cdot 10$
$-5 \cdot 8 = -40$
$-5 + 8 = 3$

② $a^2 + 6a + 5$

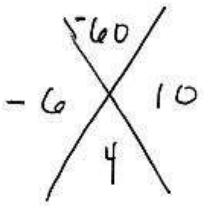
$(a+1)(a+5)$



5
$1 \cdot 5 = 5$
$1 + 5 = 6$

③ $x^2 + 4x - 60$

$(x-6)(x+10)$



60
$1 \cdot 60$
$2 \cdot 30$
$3 \cdot 20$
$4 \cdot 15$
$5 \cdot 12$
$-6 \cdot 10 = -60$
$-6 + 10 = 4$

Check my answer:

	x	-6
x	x^2	$-6x$
$+10$	$10x$	-60

$x^2 - 6x + 10x - 60$

$x^2 + 4x - 60$