Heritage High School

Algebra 1

Week 1: 4/6-4/12

Included in this packet:

Directions to Access Assignments Through Clever

Factoring GCF Notes Template

Factoring GCF Notes Key

Factoring Trinomials Notes Template

Factoring Trinomials Notes Key

Factoring Difference of Two Squares Notes Template

Factoring Difference of Two Squares Notes Key

Assignments to be submitted by 9:00 am on Monday, April 13:

Read p. 386-387, 392-393, 398-399 (hint: use the Dynamic e-book on Clever to see the video tutorials)

Complete Big Ideas – Chapter 7 Review - p. 411-412 #21-34

Little to No Technology Access- You may take a pic/scan your assignment and email it to your Algebra 1 teacher or drop it off at the main Administration office.

Access to Technology- Please see directions on "Accessing Big Ideas Through Clever.". The preferred method to complete your homework is electronically through Clever.

Accessing Big Ideas Through Clever

The preferred method of completing assignments is electronically through Clever.

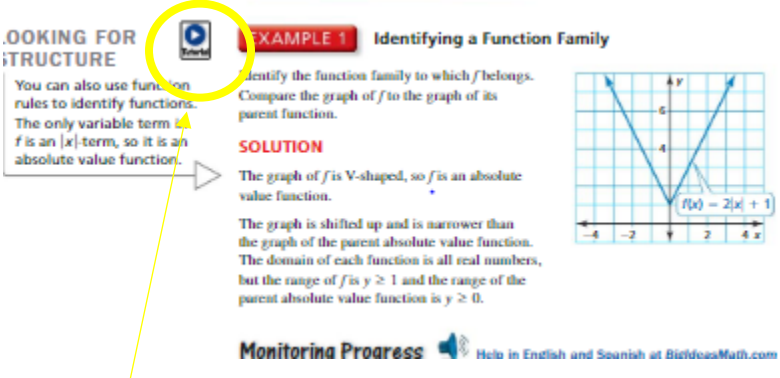
To access your assignments:

- Go to “clever.com/in/luhsd”
- Log in using your username and password as your student ID number
- Scroll down to “Math” where you will see the Big Ideas Math logo, click on “Big Ideas Math”
- If you are taking multiple math classes, you may need to select the book for the course you are working
- In the middle there is a tab that says “Assignments,” click on “Assignments”

- Choose an assignment to work on from the list. Click the pencil/enter to start the assignment.
- ***WARNING!!!!*** Clever does NOT automatically save and submit progress. Once you finish the last problem in an assignment, be sure to <u>click your name in the top-right corner and click “Submit”</u> to turn your assignment in.

To access online tutorial videos:

- Go to “clever.com/in/luhsd”
- Log in using your username and password as your student ID number
- Scroll down to “Math” where you will see the Big Ideas Math logo, click on “Big Ideas Math”
- If you are taking multiple math classes, you may need to select the book for the course you are working
- Click on “Student Dynamic ebook”
- You can use the “Contents” tab on the left to get to the section you wish to view
- In the section you will see examples that look similar to the below pic:



The blue circle with triangle indicates there is a tutorial video for that example. Click the icon to view.

Factoring Polynomials
GCF

Factoring out the greatest common factor.

Look for the largest number and greatest variable factor that all terms have in common. Divide that greatest common factor out of the polynomial.

Example 1:

a) $2x^2 + 8x - 12$ **b)** $3x^4 - 6x^2 - 9x$ **c)** $42x^6 - 21x^4 + 7x^3$

You Try!

1) $5x^2 + 15x + 10$ **2)** $36x^3 - 18x^2 + 45x$ **3)** $24x^5 - 36x^4 - 144x^3$

Example 2:

d) $15x^3y^2 - 20x^2y + 5xy$

You Try!

4) $24a^2b + 12ab - 36a$

gcf = 2x

$2x^2, 8x$

gcf = 7

21, 14

Factoring Polynomials
GCF
Target 7B

Factoring out the greatest common factor. → the largest # that evenly divides into both terms

Look for the largest number and greatest variable factor that all terms have in common. Divide that greatest common factor out of the polynomial.

Example 1:

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

$\frac{2}{2} \quad \frac{8x}{2} \quad \frac{12}{2}$

gcf = 2

$= 2(x^2 + 4x - 6)$

b) $3x^4 - 6x^2 - 9x$

$\frac{3x^4}{3x} \quad \frac{6x^2}{3x} \quad \frac{9x}{3x}$

gcf = 3x

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

c) $42x^6 - 21x^4 + 7x^3$

$\frac{42x^6}{7x^3} \quad \frac{21x^4}{7x^3} \quad \frac{7x^3}{7x^3}$

gcf = $7x^3$

$7x^3(6x^3 - 3x + 1)$

You Try!

1) $5x^2 + 15x + 10$

$\frac{5x^2}{5} \quad \frac{15x}{5} \quad \frac{10}{5}$

gcf = 5

$5(x^2 + 3x + 2)$

2) $36x^3 - 18x^2 + 45x$

$9x$

gcf = 9x

$9x(4x^2 - 2x + 5)$

3) $24x^5 - 36x^4 - 144x^3$

$12x^3$

gcf = $12x^3$

$12x^3(2x^2 - 3x - 12)$

Example 2:

d) $15x^3y^2 - 20x^2y + 5xy$

$\frac{15x^3y^2}{5xy} \quad \frac{20x^2y}{5xy} \quad \frac{5xy}{5xy}$

gcf = 5xy

$5xy(3x^2y - 4x + 1)$

You Try!

4) $24a^2b + 12ab - 36a$

$\frac{24a^2b}{12a} \quad \frac{12ab}{12a} \quad \frac{36a}{12a}$

gcf = 12a

$12a(2ab + b - 3)$

Factoring Polynomials
Trinomials (7.4-7.5)

1)

2)

3)

4)

5)

Example 1: Factor.

a) $x^2 + 9x + 20$

b) $2x^2 + 13x + 15$

You Try!

1) $x^2 + 10x + 16$

2) $3x^2 + 10x + 8$

Example 2: Factor.

a) $x^2 - 10x + 24$

b) $2x^2 - x - 10$

You Try!

3) $3x^2 + 11x - 20$

Example 3: Factor.

a) $3x^2 + 15x - 42$

You Try!

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

7.4 $a=1$*
x^2+bx+c

Factoring Polynomials Trinomials (7.4-7.5) Target 7B

7.5 $a\neq 1$
ax^2+bx+c

1) factor out gcf, if needed
2) multiply a·c
3) find two numbers that add to get "b," but multiply to get "a·c"
4) set up area model
5) factor out gcf in each row & column

Example 1: Factor.

$x^2+4x+5x+20$

a) $x^2+9x+20$

"a·c" = 20; 1·20, 2·10, 4·5 → 4 + 5 = 9 ("b")

	x	4
x	x^2	4x
5	5x	20

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

b) $2x^2+13x+15$

"a·c" = 30; 10 · 3 = 30, 10 + 3 = 13 ("b")

$2x^2+10x+3x+15$

	x	5
2x	$2x^2$	10x
3	3x	15

$=(2x+3)(x+5)$

You Try!

1) $x^2+10x+16$

$x^2+2x+8x+16$

16; 8 · 2 = 16, 8 + 2 = 10

	x	2
x	x^2	2x
8	8x	16

$=(x+8)(x+2)$

2) $3x^2+10x+8$

24; 4 · 6 = 24, 4 + 6 = 10

$3x^2+4x+6x+8$

	3x	4
x	$3x^2$	4x
2	6x	8

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

Example 2: Factor.

a) $x^2 - 10x + 24$

$+ \cdot +$

$-6 \cdot -4$

24 -6 -4 -10

$x^2 - 6x - 4x + 24$

	x	-6
x	x^2	$-6x$
-4	$-4x$	24

$= (x-6)(x-4)$

b) $2x^2 - x - 10$

$2x^2 - 5x + 4x - 10$ $\quad -20$ $\quad 4$ $\quad -5$ $\quad -1$

	$2x$	-5
x	$2x^2$	$-5x$
2	$4x$	-10

$= (2x-5)(x+2)$

You Try!

3) $3x^2 + 11x - 20$

Example 3: Factor.

a) $\frac{3x^2}{3} + \frac{15x}{3} - \frac{42}{3}$

$3(x^2 + 5x - 14)$ $\quad -14$ $\quad -2$ $\quad 7$ $\quad 5$

$x^2 + bx + c$

$a = 1$

$= 3(x+7)(x-2)$

You Try!

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

$a = 1$

$2(x^2 + 6x + 8)$ $\quad 8$ $\quad 4$ $\quad 2$ $\quad 6$

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

conclusion of lesson

When $a = 1$ after you identify the 2 #'s that multiply to get "a·c" & add to get "b" you have enough info for factors. Area model not needed!

Factoring Using Difference of Squares

Name: _____
Date: _____

Starter

Find the product of each.

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

2. $(2x+5y)(2x-5y)$

Factoring Using Difference of Squares

- *Difference of Squares* is a shortcut that can be used to factor an expression of the form $x^2 - y^2$.
- In this general case, the factored expression is $(x+y)(x-y)$.
- Note: the GCF may be used before using difference of squares.
- Another note: THIS TECHNIQUE DOES NOT WORK WITH A "SUM OF SQUARES"

Examples:

Factor $x^2 - 25$
$(x+5)(x-5)$

Factor $x^2 - 9$
$(x+3)(x-3)$

Factor $3x^2 - 75$
$3(x^2 - 25)$
$3(x+5)(x-5)$

Example 1: Factor the following difference of squares:
SOME MAY TAKE MORE THAN ONE STEP!

a) $x^2 - 64$

b) $16h^2 - 9a^2$

c) $121 - 4b^2$

d) $27g^3 - 3g$

e) $b^4 - 16$

f) $x^4 - 81$

You Try!

1) $x^2 - 25$ 2) $4x^2 - 81$ 3) $n^4 - 25$ 4) $5y^2 - 45$

Factoring Using Difference of Squares (7.7)
Target 7B

Name: _____
Date: _____

Starter

Find the product of each.

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

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

x^2-9

2. $(2x+5y)(2x-5y)$

	$2x$	$-5y$
$2x$	$4x^2$	$-10xy$
$5y$	$10xy$	$-25y^2$

$4x^2-25y^2$

Factoring Using Difference of Squares

- *Difference of Squares* is a shortcut that can be used to factor an expression of the form $x^2 - y^2$.
- In this general case, the factored expression is $(x+y)(x-y)$.
- Note: the GCF may be used before using difference of squares.
- Another note: THIS TECHNIQUE DOES NOT WORK WITH A "SUM OF SQUARES"

Examples:

Factor $x^2 - 25$
$(x+5)(x-5)$

Factor $x^2 - 9$
$(x+3)(x-3)$

Factor $3x^2 - 75$
$3(x^2-25)$
$3(x+5)(x-5)$

Example 1: Factor the following difference of squares:
SOME MAY TAKE MORE THAN ONE STEP!

a) $x^2 - 64$
$(x+8)(x-8)$

b) $16h^2 - 9a^2$
$(4h+3a)(4h-3a)$

c) $121 - 4b^2$
$(11+2b)(11-2b)$

d) $27g^3 - 3g$
$3g \quad 3g$
$3g(9g^2-1)$
$3g(3g+1)(3g-1)$

e) $b^4 - 16$
$(b^2+4)(b^2-4)$
$(b^2+4)(b+2)(b-2)$

f) $x^4 - 81$
$(x^2+9)(x^2-9)$
$(x^2+9)(x+3)(x-3)$

You Try!

1) $x^2 - 25$ 2) $4x^2 - 81$ 3) $n^4 - 25$ 4) $5y^2 - 45$

$(x+5)(x-5)$ $(2x+9)(2x-9)$ $(n^2+5)(n^2-5)$ $5(y^2-9)$

$5(y+3)(y-3)$

To be a difference of two squares:

- binomial (2 terms)
- subtraction
- both terms can evenly be $\sqrt{\ }$

ex: x^2-16 ✓

$4x^2-25$ ✓

x^2+9 ✗

x^4-4 ✓

x^5-25 ✗

$\sqrt{\ }$ = use shortcut

X = not a dif of 2 squares