Unit 5: Quadratic Expressions and Equations

Name:_____

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EQ : What algebraic properties are used to solve quadratic equations?

***=quiz to follow

Unit 5 Learning Standards

- I can add and subtract polynomials. (8.1)
- I can classify a polynomial by its degree and number of terms (8.1)
- I can multiply polynomials. (8.2 & 8.3)
- I can factor polynomials using a variety and multiple approaches (GCF, Slide n Divide, Product Sum) (8.4-8.7)
- I can solve a quadratic. (8.6 & 8.7)
- I can identify and solve the application of a quadratic. (8.8)
- I can identify a perfect square trinomial. (8.9)

8.1
Adding and Subtracting Polynomials

Polynomial: an expression in which terms are added (or subtracted) in the form ax^k where k is a positive integer.

degree

constant

Polynomial in standard form: $2x^3 + 5x^2 - 4x + 7 \longleftarrow$ term

Leading
Coefficient

Adding Polynomials. There are two ways to do this.

Ex. 1: Find the sum of the following polynomials and write the answer in standard form.

a) $\left(-8x^3 + x - 9x^2 + 2\right) + \left(8x^2 - 2x + 4\right) + \left(4x^2 - 1 - 3x^3\right)$

This can be done vertically or horizontally.

Vertically: Horizontally:

b) $\left(6x^2 - x + 3\right) + \left(-2x + x^2 - 7\right)$

Vertically: Horizontally:

Subtracting polynomials. Again, there are two ways to do this.

Ex. 2: Find the difference of the following polynomials. Write the answer in standard form.

a) $\left(-6x^3 + 5x - 3\right) - \left(2x^3 + 4x^2 - 3x + 1\right)$

Vertically: Horizontally:

b) $\left(4x^2 - 1\right) - \left(3x - 2x^2\right)$

Vertically: Horizontally:

Classifying Polynomials

Polynomial	Degree	Classified by degree	Classified by # of terms
-5			
$\frac{1}{4}x$			
$-9x +2$			
$x^2 -6$			
$1-x^2 +2x$			
$3x^4 +2x^3 -x^2 +5x -8$			

Write the polynomial in standard form.

1) $3x + 4y^2 - 2$

2) $5x^2 + 4 - 3x$

3) $x - 7x^3 + 2$

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

5) $7x - 2$

6) $-4x + 7x^4 - 5x^3 + 1$
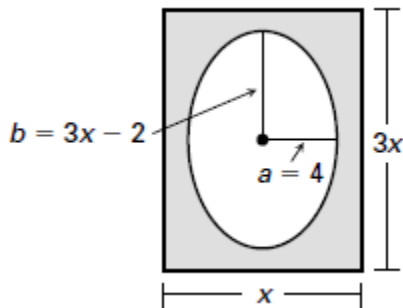
Use a vertical format to add or subtract.

7) $(x^2 + 2x + 7) + (4x^2 + x - 3)$

8) $(6n^2 + 4n + 6) - (5n^2 + n + 2)$

9) $(-x + x^2 + 3) - (-2 + 5x - 3x^2 + 7x^4)$

10) $(2x^2 + 3) - (6x + 4) + (3x^2 + x)$

11) A mat in a frame has an opening for a photograph (see figure). Find the area of the mat. (Area of opening: $A = \pi ab$, where ≈ 3.14)

$b = 3x - 2$

$3x$

$a = 4$

x

Show your work

1. Find the product.

    $x^2(3x - 7)$

2. Find the product.

    $(w + 5)(w + 2)$

3. Find the product.

    $(x + 6)(x - 3)$

4. Find the product.

    $6y(4 - 5y)$

5. Find the product.

    $(t + 3)^2$

6. Find the product.

    $(2x + 5)(4x^2 - 3x + 2)$

7. Find the product.

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

8. Find the product.

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

9. Find the product.

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

10. Find the product.

    $(n + 5)(n + 1)$

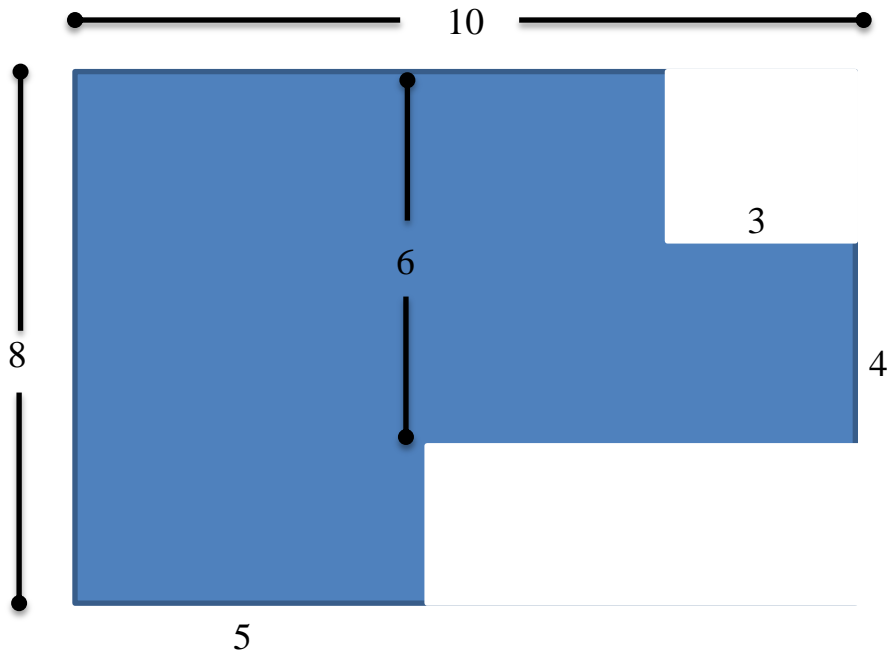11. Find the product.

    $(2x - 2)(x + 8)$

12. Find the product.

    $(-2a^2)(5a^2 + 3a - 7)$

Develop a plan of how to find the area of the shape below. Then, determine its area.

8.3 Application

In Exercises 1–3, evaluate the expression for $x = 2$ and $y = -3$. Then choose the statement below that is true about the results.

A) The number in column A is greater.
B) The number in column B is greater.
C) The two numbers are equal.
D) The relationship cannot be determined from the given information.

	Column A	Column B
1.	$2x(x^2 + 3x + 1)$	$-2y(3y^2 + 2y)$
2.	$(x + 1)(x - 6)$	$(3y + 2)(2y + 5)$
3.	$(2x - 9)(x - 5)$	$(y + 3)(y^2 + 2y + 5)$

4) If a rectangle has length of $7m + 2$ and a width of $3 + m$, express its area as a polynomial.

5) The floor plan of a home is shown below. Find an expression for the area of the home. What is the area if $x = 20$ feet?

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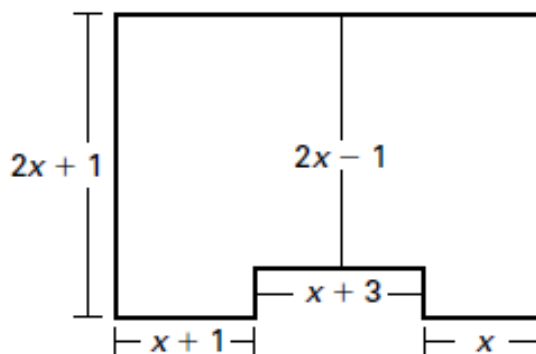
1) Match the equivalent expressions

A) $(a + b)(a - b)$

B) $a^2 + 2ab + b^2$

_____

C) $(a + b)^2$

D) $a^2 - b^2$

_____

E) $a^2 - 2ab + b^2$

F) $(a - b)^2$

_____

For 2-5, find the missing term.

2) $(x+ 8)^2 = x^2 +$ _____ $+64$

3) $(9+ 2c)(9 - 2c) = 81 -$ _____

4) $(m - n)^2 = m^2 -$ _____ $+n^2$

5) $(2a +3b)^2 = 4a^2 +$ _____ $+9b^2$

Write the product of the sum and difference, square the binomial or find the product.

6) $(m + 7)^2$

7) $(k + 7)(k - 7)$

8) $(4n + 5)^2$

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

10) $(v - 2)^2$

11) $(y - x)^2$

8.4 Application

In humans, the brown eye gene B is dominant and the blue eye gene b is recessive. This means that humans whose eye genes are BB, Bb or bB have brown eyes and those with bb have blue eyes. The Punnett square below shows the results of eye colors for children of parents who each have one B gene and one b gene.

	B	b
B	BB	Bb
b	bB	bb

1) Given the following models this concept: $(0.5B + 0.5b)^2 = 0.25BB + 0.5Bb + 0.25bb$, explain what this means.

2) What is another way to write $0.25BB + 0.5Bb + 0.25bb$? How was $0.25BB + 0.5Bb + 0.25bb$ derived?

3) What percentage of children will have brown eyes? Explain how this compares to our class.

4) What percentage will have blue eyes? Explain how this compares to our class.

5) Calculate and/or explain if a recessive gene will be wiped out.

For numbers 1 – 4, add or subtract the polynomials. Be sure to write your answer in standard form. Then classify the polynomial by terms and degree

1. $(3x^2 + 5x + 7) + (8x + 4 + x^2)$

2. $(-8x^3 + 2x^2 + 4) + (-9x^3 - 4x^2 + 2x + 10)$

Answer:_____

Answer:_____

_____ _____

_____ _____

3. $(2x + 1 + 9x^4) – (5x^4 + 2x + 12)$

4. $(2x^2 + 3x + 4) – (6x + 7 + 2x^2)$

Answer:_____

Answer:_____

_____ _____

_____ _____

For numbers 5 – 12, multiply the polynomials.

5. $6x^2(4x^3 – 3)$

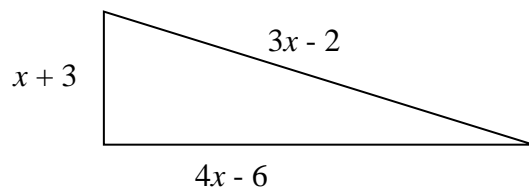6. $(2x + 6)(3x - 8)$

7. $(x + 8)(x – 8)$

8. $(x + 7)^2$

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

10. $(3x – 2y)^2$

11. $(x – 4)(x^2 – 2x – 3)$

12. $(4x – 5)(7x – 12)$

For 13 & 14, use the following right triangle:

$x + 3$

$3x - 2$

$4x - 6$

13. Write a polynomial expression for the perimeter.

14. Write a polynomial expression for the area. ($A = \dfrac{1}{2}bh$)

1) Similar to how you could approach $5x = 35$ thinking what number multiplied by five would yield 35? Think about approaching multiplying polynomials the same way. What's the missing part of the box/foil/horizontal/vertical?:

a) Find the missing linear binomial Z: $(x + 6)\ \mathbf{Z} = x^2 + 3x + 6x + 18$

b) Find the missing linear binomial Z: $(j - 1)\ \mathbf{Z} = j^2 + 8j - j - 8$

c) Find the missing linear binomial Z: $(k - 3)\ \mathbf{Z} = 7k^2 - 21k - 5k + 15$

2) Find the product:

a)
$$(6x - 9)(4x^2 + 1)$$

b)
$$\left(x + \tfrac{3}{4}\right)\left(x - \tfrac{1}{4}\right)$$

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

3) If $\mathbf{A} = n - 4$ and $\mathbf{B} = n^2 - 6n + 8$, find:
   a)   A + B
   b)   A − B
   c)   (A)(B)

4)   Find the product $(4p + 6p^2)^2$

Factor the GCF out of each expression if possible.

1. $6x^3 + 18x^2$

2. $3c^3 - 12c$

3. $-10m^3 - 2m$

4. $35a^3 - 28a^2$

5. $32x - 48x^2$

6. $35xy - 60x^2$

7. $3m^2 + 24m + 36$

8. $4x^2 + 4x - 80$

9. $2t^3 + 2t^2 - 12t$

10. $6x^3 + 24x^2 + 24x$

11. $x^3 + x^2 + 4x + 4$

12. $8d^3 + 16d^2 + 3d + 6$

GCF & Zero Product Practice

For 1 - 6 factor the GCF from the polynomial

1) $15ad + 30a^2d^2$

2) $4d^2 + 16$

3) $6r^2t - 3rt^2$

4) $-6mp + 4m + 18p - 12$

5) $9ax^3 + 18bx^2 + 24cx$

6) $4b^2 - 12b + 2b - 6$

For 7-15, solve each equation. Check your solutions and the number of solutions. Remember, you may have to factor first.

7) $x(x - 32) = 0$

8) $4b(b + 4) = 0$

9) $(y - 3)(y + 2) = 0$

10) $(4y + 8)(3y - 4) = 0$

11) $2z^2 + 20z = 0$

12) $8p^2 - 4p = 0$

13) $18x^2 = 15x$

14) $14x^2 = -21x$

15) $8x^2 = -26x$

16) A landscaping company has been commissioned to design a triangular flower bed for a mall entrance. The final dimensions of the flower bed have not been determined, but the company knows that the height will be two feet less than the base. The area of the flower bed can be represented by the equation $A = \frac{1}{2}b^2 - b$.

a. Write this equation in factored form.

b. Suppose the base of the flower bed is 16 feet. What will be its area?
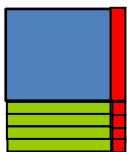
GOAL: **RULES:**   •
                                                                •
                                                                •

Factor 1-6 using manipulatives.   Sketch what your manipulatives looked like to determine your factorization.

E*x*. 1 Factor: $x^2 + 2x + 3x + 6$ E*x*. 2 Factor: $x^2 + 1x + 4x + 4$

E*x*. 3 Factor: $x^2 - 2x - 5x + 10$ E*x*. 4 Factor: $x^2 - x + 3x - 3$

E*x*. 5 Factor: $3x^2 + 3x + 2x + 2$ E*x*. 6 Factor: $5x^2 - 2x - 15x + 6$

A) Looking at factoring using a box I provided and using the manipulatives, what was the difference in the problems?

B) Reflect on how you factored using manipulatives. What pattern did you notice if any?

Try factoring problems 7-12 using the Algebra tiles. Write your products below:

7) $x^2 + 5x + 6$

8) $x^2 + 7x - 8$

9) $x^2 + x - 6$
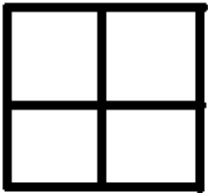
10) $x^2 - 4x + 4$

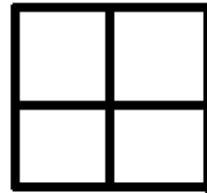11) $x^2 - 6x + 9$

12) $x^2 - x - 6$

C) Analyze the difference in problems 1-6 versus 7- 12. Distinguish what the obstacle is between the two types of problems.

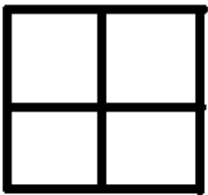**Factor 1-4 using the area of a rectangle:**

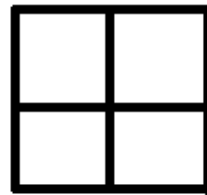Ex. 13   Factor: $x^2 + 2x + 1x + 2$
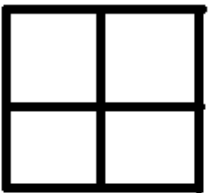

Ex. 14   Factor: $x^2 + 6x + 8$

Ex. 15   Factor: $x^2 + 5x + 6$

Ex. 16 Factor: $x^2 - 6x + 5$

Ex. 17   Factor: $x^2 + 3x - 4$

Ex. 18   Factor: $x^2 - 2x - 8$
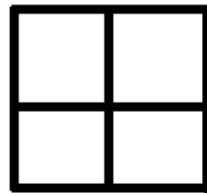
Ex. 19   Factor: $10x^2 - 15x + 6x - 9$

18
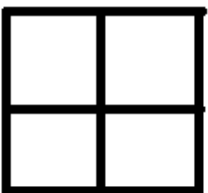
Ex. 20   Factor: $2x^2 + 8x - 4x - 16$
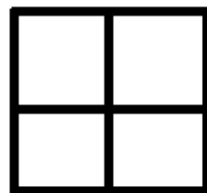
Given the possible area, find the length and width of the following rectangles

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

2. $x^2 - 2x - 8$

3. $x^2 - 7x + 10$

4. $16 + 17x + x^2$

5. $2y^2 - 2y - 12$

6. $p^3 - 13p^2 + 36p$

7. $v^2 + 6v + 8$

8. $6m^3 + 24m^2 - 72m$

9. $5t^3 + 5t + 10t^2$

10. $b^2 - 3b + 8$

Factor the expression <u>completely.</u>

1. $32x^3 + 24x^2$

2. $-3c^3 - 30c$

3. $n^2 - 15n + 14$

4. $64xy - 72x^2$

5. $x^2 + 11x + 24$

6. $h^2 - 2h - 24$

7. $3m^2 + 24m + 36$

8. $4x^2 + 4x - 80$

9. $2t^3 + 2t^2 - 12t$

10. $6x^3 + 24x^2 + 24x$

11. $d^5 + 4d^4 - 16d^2 + 8d$

12. $-24u - 25 + u^2$

Choose the correct factorization. If neither is correct, find the correct factorization.

1. $2x^2 - 3x - 20$ A) $(2x + 5)(x - 4)$ B) $(2x + 10)(x - 2)$

2. $3x^2 + 11x - 4$ A) $(3x - 1)(x + 4)$ B) $(3x - 2)(x + 2)$

3. $3x^2 - 12x + 12$ A) $(x - 3)(3x - 4)$ B) $(x - 2)(3x - 6)$

Factor or solve as applicable if possible.

4. $2x^2 - 5x - 3$ 5. $5x^2 + 7x + 2$ 6. $6x^2 - 11x + 3$

7. $30x^2 + x - 1$ 8. $17b^3 - 34b^2 = 0$ 9. $5m^3 + 50m^2 + 125m$

10. $12 + 2x^2 + 14x = 0$

11. $35a^3 + 28a^4$

12. $x^2 - 15x - 36$

13. $3n^2 - 7n + 2 = 0$

14. $-15 = 4a^2 - 16a$

15. $10b^2 - 15b = 8b - 12$

BONUS PROBLEMS.

16. Solve: $x^2 = 144$

17. Solve: $(x + 8)^2 = 4$

$$h = -16t^2 + vt + s$$

- t is time in seconds
- v is the initial upward velocity in feet per second **(negative if downward)**
- s is the initial height in feet
- h is height in feet

1) Lauren dove into a swimming pool from a 15-foot-high diving board with an initial upward velocity of 8 feet per second. Find the time t in seconds it took Lauren to enter the water. Use the model for vertical motion.

$$h = -16t^2 + vt + s$$

2) Jason jumped off of a cliff into the ocean in Acapulco while vacationing with some friends. His height as a function of time could be modeled by the function $h(t) = -16t^2 + 16t + 480$.

a. What is his velocity? Is it upward or downward?

b. What was his initial height?

c. Jason hit the water after how many seconds?

3) An outfielder in baseball attempts to throw out a runner from third base at home plan. He releases a baseball at a height of 6 feet with an initial velocity of 46 feet per second. Find the time (in seconds) for the ball to reach the catcher's mitt. (You can assume a perfect throw where the ball hits plate off the fly).

Factor the expression completely.

1. $x^2 + 5x - 14$

2. $x^2 - 12x - 64$

3. $h^2 - 11h + 30$

4. $w^2 + 3w - 28$

5. $x^2 - 81$

6. $49 + y^2 + 14y$

7. $4x^2 - 20x + 25$

8. $4x^2 - 25$

9. $2x^2 + 5x + 3$

10. $6p^2 + 14p + 4$

11. $4x^2 + 15x + 9$

12. $63g^6 - 54g^2$

Solve the equation.

13. $(x + 8)(x - 3) = 0$

14. $(a + 7)^2 = 0$

15. $x^2 - 4x + 3 = 0$

16. $x^2 - 5x = 14$

17. $0 = b^3 - 100b$

18. $3x^2 + 4 = 8x$

19. $m^2 - 6m = -9$

20. $x^2 - 25 = 0$

21. $3q^2 - 3q = 6$

22. Write a quadratic trinomial equation in standard form that has the given solutions: -1 and 3.

23. A) Find an expression for the area of the figure. B) Find an expression for the perimeter of the figure

$x + 1$

$x + 1$

FACTORING FLOW CHART

Can you factor a common term (GCF)?

Can it be factored again?

How many terms??

Can you factor more?

Finding the area of a rectangle or unbox

If you had to solve, how is the process the same? Different?
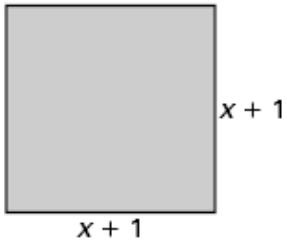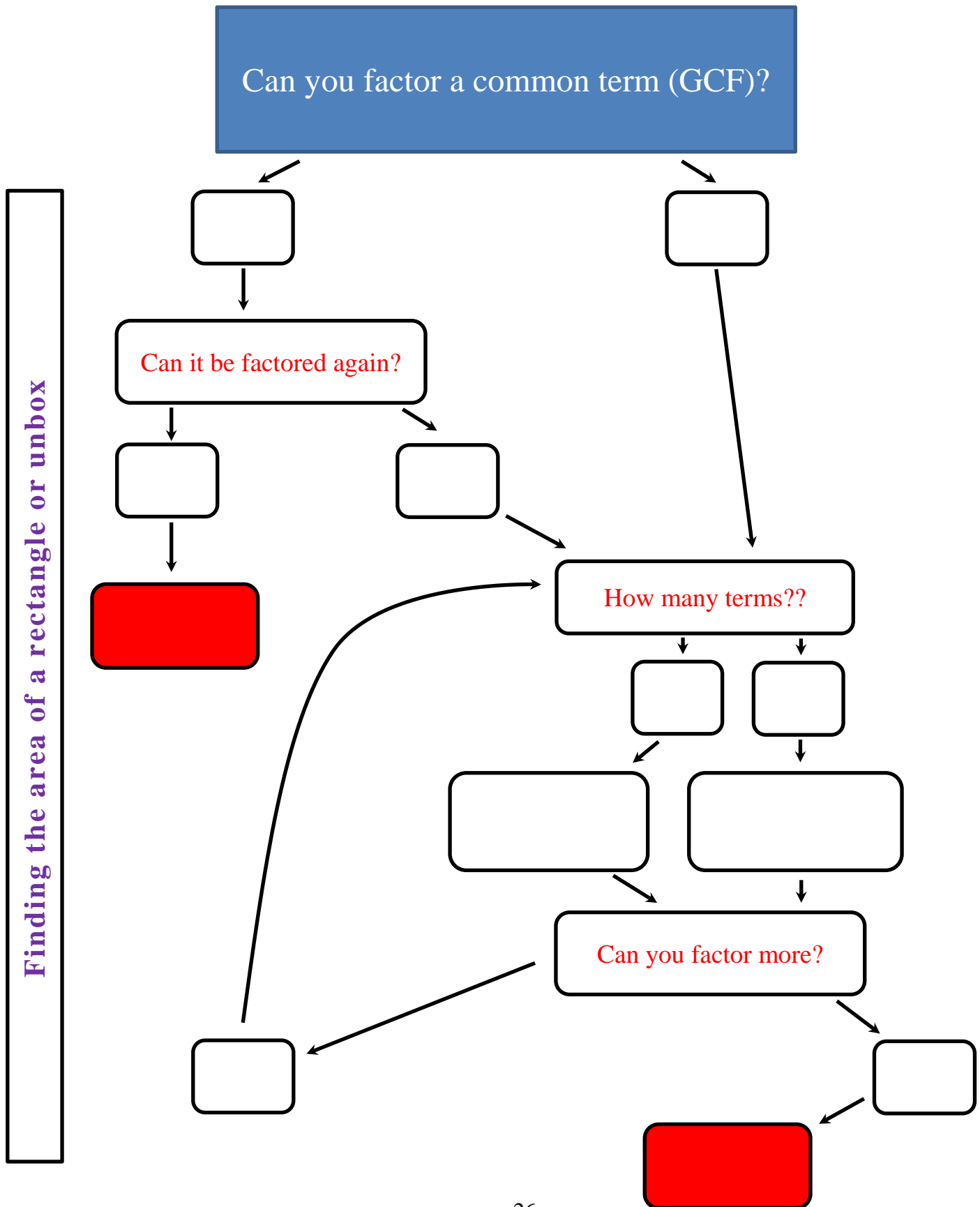
1) Find the **sum**:
$$(3x^3 + 2x^2 - 8) + (-5x^2 + 3x - 2)$$

2) Find the **difference**:
$$(3x^3 + 2x^2 - 8) - (-5x^2 + 3x - 2)$$

Find the **product:**

3) $(3x-1)(2x+7)$

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

5) $(5x-1)^2$

6) $-2x^5(3x^2 - x + 4)$

7) What is the **greatest common factor?**
$$6x^2 y^3 - 3xy^2 + 12x^4 y^5$$

Write in **factored form:**

8) $12x^2 + 30x + 18$

9) $5x^2 - 625$

10) $x^2 + 2x - 15$

Find the **solution set:**

11) $16x^2 - 8x = -1$

12) $4x^2 + 4x - 24 = 0$

13) What are the **roots?**
$$(2x+1)(x-2) = 0$$

14) Can this **trinomial** be written as a **perfect square binomial?**
$$x^2 + 14x + 49$$

15) Solve the quadratic: $(x + 1)(x - 13) = -33$

Find each sum or difference.

1. $(7m^2 + 3m - 4) - (3m^2 + 9m - 5)$

2. $(4y^2 + 3y - 7) + (4y^2 - 7y - 2)$

Find each product.

3. $3x^2y(2x^2y - 5xy^2 + 8y^3x^2)$

4. $(3r^2 + 5t^2)(3r^2 - 5t^2)$

5. $(5y + 6)^2$

Factor each polynomial.

6. $10x^2yz - 22x^3y^2z$

7. $2xy - 4x + 3y - 6$

8. $m^2 + 12m - 28$

Factor each polynomial, if possible. If the polynomial cannot be factored, write _prime_.

9. $5t^2 + 17t - 12$

10. $6p^2 - 20p + 16$

11. $3x^5 - 75x^3$

12. $25x^2 + 70x - 49$

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

Solve each equation. Check the solutions.

13. $5x + 8 = 3 + 2(3x - 4)$

13. _____

14. $-5(2n - 3) = 7(3 - n)$

14. _____

15. $(x + 5)(4x - 3) = 0$

15. _____

16. $12b^2 - 8b = 0$

16. _____

17. $9n^2 + 6n = 3$

17. _____

18. $4b^2 - 8b - 5 = 0$

18. _____

19. $64x^2 - 1 = 0$

19. _____

20. The length of a rectangular garden is 5 feet longer than its width. The garden is surrounded by a 2-foot-wide sidewalk. The sidewalk has an area of 76 square feet. Find the dimensions of the garden.

20. _____

21. Lanu hit a volleyball into the air with an initial upward velocity of 24 feet per second. The height h in feet of the ball above the ground can be modeled by $h = -16t^2 + 24t + 3$, where t is the time in seconds after Lanu hit the volleyball. Find the time it takes the ball to reach 12 feet above the ground.

21. _____

22. The area of a rectangular room is 104 square feet. The length of the room is 5 feet longer than the width. Find the dimensions of the room.

22. _____

1) Subtract: $(-2x^3 + 2x^2 - x - 1) - (3x^3 + 5x^2 - x + 5)$

2) Multiply: $(x + 3)(-3x - 6)$

3) Multiply: $(4x - 8)(4x + 8)$

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

5) Solve: $(x - 4)(x + 2) = 0$

6) Solve: $x^2 + 3x = 54$

7) Factor: $3x^2 - 19x - 40$

8) Factor: $9x^2 - 12x + 4$

9) Factor: $64x^2 - 25$

10) Solve: $x^2 = 49$

11) A soccer goalie throws a ball into the air at an initial height of 8 feet and an initial vertical velocity of 28 ft/sec. After how many seconds does the ball hit the ground?

12) One width of a rectangle can be written as $(b + 9)$. The length can be written as $(b - 4)$. Write a quadratic trinomial that represents the area.

13) What is the GCF of $24g^5v^2 - 30gv^2$?

14) Multiply: $(z - 9)(z^2 + 2z - 1)$

15) Find the roots of $-2 = x^2 - 7x + 8$

16) Solve: $35 = -4x + 4x^2$

17) Solve: $(m + 8)(m + 3) = -4$

Question #1
Classify by degree the polynomial resulting from the sum of $(3x^3 - 3x + 4) + (2x^2 - 1)$.

A) Quadratic   B) Cubic   C) Quartic   D) none of these

Question #2
From 1985 through 1995, the gross farm income G and farm expenses E (in billions of dollars) in the United States can be modeled by $G = -0.246t^2 + 7.88t + 159$ and $E = 0.174t^2 + 2.54t + 131$ where t is the number of years since 1985. The net farm income, N, is found by using the formula $N = G - E$. Which of the following represents the net farm income?

A) $-0.072t^2 + 10.42t + 290$ B) $-0.42t^2 + 5.34t + 28$
C) $-0.42t^2 + 10.42t + 290$ D) $-0.42t^2 + 5.34t + 290$

Question #3
Which of the following is a perfect square trinomial?

A) $3x^2 - 2x - 5$ B) $2x^2 + 3x - 9$ C) $4x^2 - 15x - 25$ D) $4x^2 - 20x + 25$

Question #4
Which polynomial is equivalent to $(4n - 1)^2$?
A) $16n^2 + 1$

B) $16n^2 - 4n + 1$

C) $16n^2 - 8n + 1$

Question #5
What is the product of $(h - 8)$ and $(h - 3)$?
A) $2h - 11$

B) $h^2 + 24$

C) $h^2 - 5h + 24$

D) $h^2 - 11h + 24$

Question #6
What is the simplest form of $(-2p + 7)(4p - 3)$?
A) $-8p^2 + 34p - 21$

B) $-8p^2 + 22p - 21$

C) $-8p^2 - 22p - 21$

D) $-8p^2 - 34p - 21$

Which expression is the product of $(2x - 3)(4x^2 + 4x + 5)$**?**

A) $8x^3 + 8x^2 + 10x - 15$

B) $8x^3 - 4x^2 - 2x - 15$

C) $8x^3 - 12x^2 + 6x - 15$

D) $8x^3 - 20x^2 + 22x - 15$

Which polynomial expresses the difference of these two polynomials?

$$\left(7k^6 + 6k - 10\right) - \left(-3k^6 - 7k + 1\right)$$

A) $10k^6 + 13k - 11$

B) $10k^6 - 1k - 9$

C) $10k^6 - 1k - 11$

D) $10k^6 + 13k - 9$

Which polynomial is equivalent to $4b^3 \left(2b^4 - 10b^3 + 3\right)$**?**

A) $8b^{12} - 40b^9 + 12b^3$

B) $8b^{12} - 40b^9 + 12$

C) $8b^7 - 40b^6 + 12b^3$

D) $8b^7 - 40b^6 + 12$

George earns \$9.50 per hour and \$35.00 commission per sale, but he pays \$12.00 in license fees each week. Mary earns \$13.50 per hour and \$11.25 for every defect she corrects, but she must pay \$37.00 for tool rentals each week. The expressions below represent their individual earnings every two-week pay period.

George: $9.5h + 35s - 2(12)$
Mary: $13.5h + 11.25d - 2(37)$

where:
$h=$**the number of hours worked**
$s=$**the number of sales George makes**
$d=$**the number of defects Mary corrects**

If George and Mary work the same number of hours each pay period, which expression represents their combined earnings for one pay period?

A) $23h + 46.25ds - 196$

B) $23h + 46.25ds - 98$

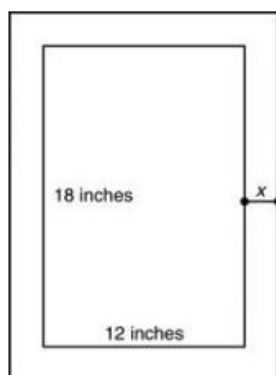C) $23h + 35s + 11.25d - 196$

D) $23h + 35s + 11.25d - 98$

Which expression represents the difference of $2x^3 + 5x^2 - 6x$ and $2x^2 - 3x + 8$?

A) $-2x^3 + 7x^2 - 9x + 8$

B) $-2x^3 - 3x^2 + 3x + 8$

C) $2x^3 + 3x^2 - 9x - 8$

D) $2x^3 + 3x^2 - 3x - 8$

Question #12
Luis designed a poster with a 12- by 18-inch rectangular picture surrounded by a border. The border is x inches wide on all four sides as shown.

18 inches

x

12 inches

The area of the poster can be represented by the expression $(2x + 12)\ (2x + 18)$. Which expression is equivalent to the area of the poster in square inches?

A) $4x^2 + 216$

B) $4x^2 + 24x + 216$

C) $4x^2 + 34x + 216$

D) $4x^2 + 60x + 216$

Question #13
Jill multiplied two binomials together, which also resulted in a binomial. An example is…
$$(x - 4)(x + 4) = x^2 - 16$$

Jill concluded that the product of any two binomials is also a binomial. The product of which pair of binomials disproves Jill's conclusion.

A) $(x - 2)(x + 2)$ B) $(x - 3)(x + 3)$ C) $(x + 1)(x - 3)$ D) $(x - 5)(x + 5)$

Question #14
Determine the value of x in the following equation: $3x^2 = 363$.

A) ±121 B) ±11 C) ±3 D) ±6

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

A) $(4x - 25)$

B) $(4x^2 - 10)$

C) $\left(4x^2 - 25\right)$

D) $\left(4x^2 - 20x - 25\right)$

What binomial must be subtracted from $(7r - 5)$ so that the difference of the 2 polynomials is $(5r + 8)$?

A) $2r + 3$

B) $2r - 13$

C) $12r + 3$

D) $12r - 13$

Which binomial must be added to $(-2r + 12)$ so that the sum of the 2 polynomials is $(6r - 7)$?

A) $4r - 19$

B) $4r + 5$

C) $8r - 19$

D) $8r + 5$

Which product is equivalent to this polynomial?

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

A) $(3x + 3)\,(x - 3)$

B) $(3x - 9)\,(x + 1)$

C) $3(x + 1)\,(x - 3)$

D) $3\,(x + 3)\,(x - 1)$

Which expression shows $2x^2 + 18$ factored completely?

A) $2\,(x + 3)^2$

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

C) $2\,(x^2 + 9)$

D) $2\,(x^2 + 16)$

A square has an area of $49x^2 - 56x + 16$ square meters. Which expression represents the length of each side, in meters?

A) $7x - 4$

B) $7x + 4$

C) $28x - 16$

D) $(28x - 16)^2$

What is the greatest monomial factor of the polynomial $4xy^2 - 6x^2y^2 + 10y^2$**?**

A) $2y^2$

B) $2xy^2$

C) $4y^2$

D) $4xy^2$

Which of the following is a complete factorization $5x^2 + x - 18$**?**

A) $(5x - 9)(x + 2)$

B) $(5x + 2)(x - 9)$

C) $5(x - 2)(x - 9)$

D) $5(x + 9)(x - 2)$

The time a projectile spends in the air can be modeled by the equation $t^2 - 2t - 8 = 0$**, in which** t
represents the amount of time traveled, in seconds. Which of the following is equivalent to the
equation $t^2 - 2t - 8 = 0$**?**

A) $(t - 4)(t + 2) = 0$

B) $(t - 4)(t - 2) = 0$

C) $(t + 4)(t + 2) = 0$

D) $(t + 4)(t - 2) = 0$

$4x^2 - 36x + 81 =$

A) $(2x - 9)^2$

B) $(2x + 9)^2$

C) $(2x + 6)(2x - 6)$

D) $(2x + 9)(2x - 9)$

Which expression represents the factors of $4z^2 - 49$**?**

A) $(2z - 7)^2$

B) $(4z - 7)^2$

C) $(2z - 7)(2z + 7)$

D) $(4z - 7)(4z + 7)$

What is $2t^3 + 8t^2 - 24t$ **in factored form?**

A) $2t(t - 2)(t + 6)$

B) $2t(t + 2)(t - 6)$

C) $2t(t - 3)(t + 4)$

D) $2t(t + 3)(t - 4)$

What is $2x^2 + 7x - 4$ **in factored form?**

A) $(2x - 1)(x + 4)$

B) $(2x + 1)(x - 4)$

C) $(2x - 4)(x + 1)$

D) $(2x + 4)(x - 1)$

Which expression is equivalent to $3x^2 - 48$ **in factored form?**

A) $(x + 4)^2$

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

C) $(x + 4)(x - 4)$

D) $3(x + 4)(x - 4)$

Which of the following quadratic functions has roots $x = 3$ **and** $x = -1$?

A) $x^2 - 2x - 3$

B) $x^2 - 4x + 3$

C) $x^2 + 2x - 3$

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

What is the solution set for the equation $x^2 - 3x - 18 = 0$?

A) $\{-6, -3\}$

B) $\{-6, 3\}$

C) $\{-3, 6\}$

D) $\{3, 6\}$

What is the solution set to the equation $x^2 - 4x + 5 = 50$?

A) $\{-9, \ -5\}$

B) $\{-9, \ 5\}$

C) $\{-5, \ 9\}$

D) $\{5, \ 9\}$

A softball league has a season that consists of 56 games. The equation below represents the relationship between the number of teams in the league, x**, and the total number of games played during the season.**

$$56 = x^2 - x$$

How many teams are in the league?

A) 4

B) 7

C) 8

D) 14

What is the solution to the quadratic equation $9x^2 + 30x + 25 = 0$?

A) $-\frac{5}{3}$

B) $-\frac{3}{5}$

C) $\frac{3}{5}$

D) $\frac{5}{3}$

$$\text{Solve } 2x^2 - 3x - 9 = 0 \text{ for } x.$$

A) $x = -\frac{3}{2}$ or $x = -3$

B) $x = -\frac{3}{2}$ or $x = 3$

C) $x = \frac{3}{2}$ or $x = -3$

D) $x = \frac{9}{2}$ or $x = -1$

A ball is thrown in the air. The relationship between the time the ball is in the air, t (in seconds), and the height of the ball in feet above the ground (h) is represented by $h = -16t^2 + 20t + 6$. **How many seconds will it take for the ball to hit the ground?**

A) $\frac{1}{4}$

B) $\frac{3}{8}$

C) 1.5

D) 6

Which equation has roots of −7 and 4?

A) $(x + 7)(x - 4) = 0$

B) $(x - 7)(x + 4) = 0$

C) $(x - 7)(x - 4) = 0$

D) $(x + 7)(x + 4) = 0$

A ball is thrown upward at a velocity of 15 meters per second from a height that is 20 meters above the ground. The height h (in meters) of the ball at time t (in seconds) after it is thrown can be found by the formula below.

$$h = -5t^2 + 15t + 20$$

Find the time when the ball is again 20 meters above the ground.

A) 1 second

B) 2 seconds

C) 3 seconds

D) 4 seconds

How many terms are in the expression $3x^6yz + x^4y^2 + 2xz^5 - 6x^2y^3 - 7y$?

A) 3

B) 4

C) 5

D) 6

Cornell Notes Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.) Topic:_____ _____	Name: _____ Class: _____ Period: _____ Date: _____

Essential Question:	

Questions/Main Ideas:	Notes:

Summary:

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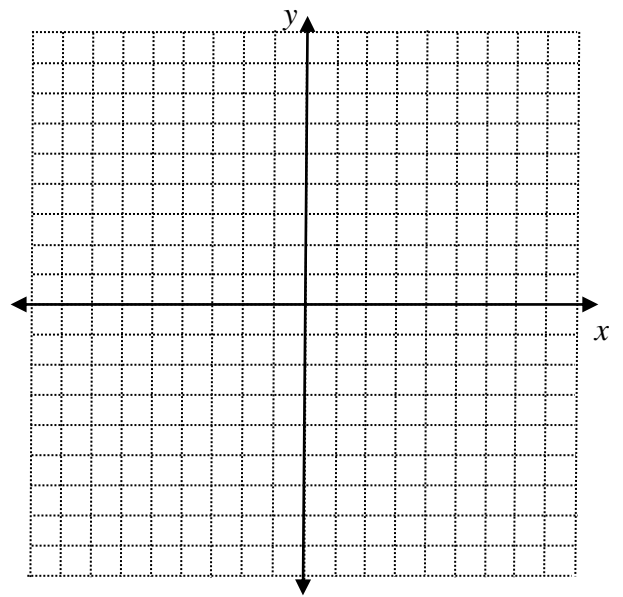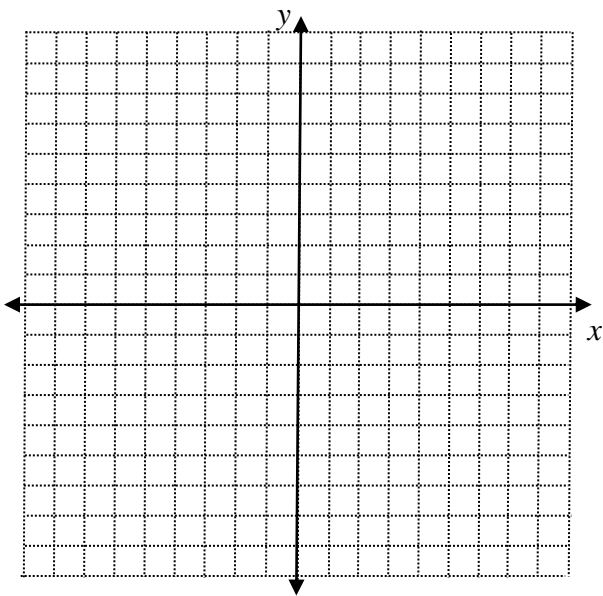| **Cornell Notes** Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.) Topic:_____ _____	Name: _____ Class: _____ Period: _____ Date: _____

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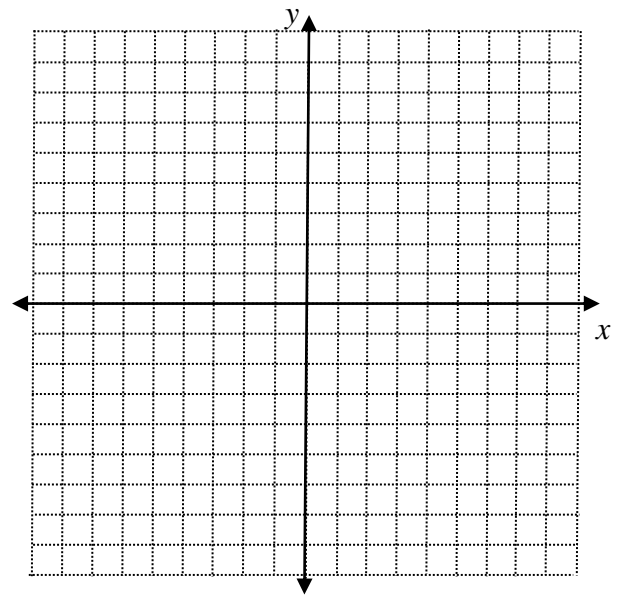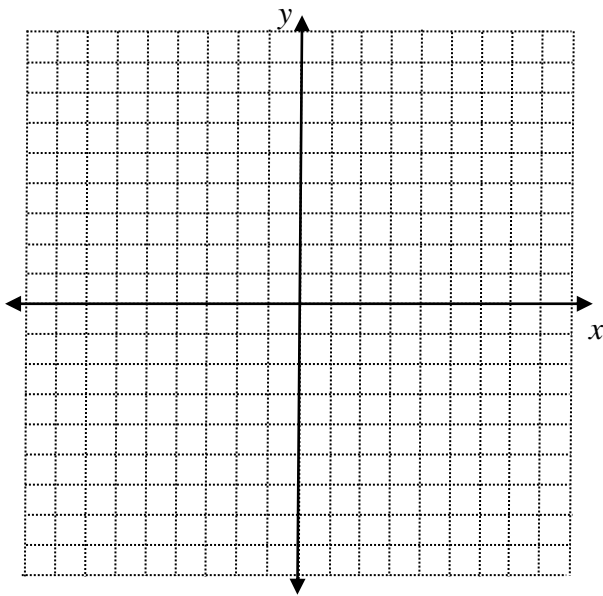| **Cornell Notes** Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.) Topic:_____ _____	Name: _____ Class: _____ Period: _____ Date: _____

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Summary:

Add on problems or addition examples:

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