Objectives:

1. SWBAT factor quadratic binomials a) in the form $x^2 - d^2$ and b) in the form $ax^2 - bx$ by finding a greatest common factor.
2. SWBAT recognize quadratic binomials that cannot be factored.

Set-Up/Materials:

Activity	Narrative		Time
Do Now	1. What are the intercepts of this graph: (x-3)(-x+7)? 2. Factor x2 + 3x + 2 3.		8:00-8:10
	Homework ?s		8:10-8:15
Transition/Hook			
Factoring Lab I/II	Guiding Questions: How can you use the factoring methods we've learned to factor a difference of squares?		8:15-8:35
	Part I: 1-2 (I do): together as a class. 3a (we do): circulate and observe student responses, then troubleshoot any misconceptions as a group 3b-d (you do): (3 min) Part II: Individual work		8:15-8:20 8:20-8:21 8:21-8:24 8:24-8:30
	Discussion:		8:30-8:35
Transition			
Notes (DOTS)	**Difference of Two Squares (DOTS)** 1. Identify the squares (take the square root of each term). 2. Write in factored form as (sum)(difference).		8:35-8:40
	Ex.: 1. $x^2 - 4$ 2. $x^2 - 289$ 3. $x^2 - 2$ 3. $x^2 - 10$		
Transition			
Classwork (DOTS)			8:40-9:00

Transition			
Factoring Lab III	Guiding Questions: How do you factor a term with variables? How do you find a greatest common factor?		9:00-9:15
	Factoring Lab (Part III)		
	Discussion:		
Transition			
Notes (GCF)	**Greatest Common Factor (GCF)** 1. Identify all of the factors in common between the terms of the quadratic. Together these are the GREATEST common factor. 2. Divide each term of the expression by the GCF. 3. Write the quadratic as a multiplication problem with the GCF in front. (THINK: this is the inverse of distributing).		9:15-9:25
	Ex.: 1. $6x^2 + 3x$ Common Factors/GCF/Factored Form: 2. $2x^2 - 8$ Common Factors/GCF/Factored Form: 3. $-25x^2 - 10x$		
Transition			
Classwork (GCF)	Practice problems simple, at least one extension problem		9:25-9:40
Transition			

Summary/When to use? When can't you use?	**When To Use GCF or DOTS** Ask yourself these questions: **1.** Are both terms squares? Is one square subtracted from the other? USE DOTS! **2.** Do both terms have factors in common? USE GCF!		9:40-9:45

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Factoring Lab Date_____

PART I: Review

1. Start with the quadratic (x+3)(x+5). Yesterday, we did this multiplication problem with Algebra Tiles by letting each binomial be one side of a rectangle. We can do this same problem with a slightly simpler representation.

	x	5
x		
3		

2. Fill in each box above by writing in the area of that box. What is the total area of the rectangle?

3. Do each multiplication problem by finding the total area of the rectangle.

a. (x+5)(x-4)

	x	5
x		
-4		

Area/Solution:_____

b. (x-2)(x+1)

Area/Solution:_____

4. Factor each problem by determining what must have been multiplied to get the following areas.

a. $x^2 - 7x + 12$

x^2	-3x
-4x	12

Factored form:_____

b. $x^2 + 6x + 9$

x^2	3x
	9

Factored Form:_____

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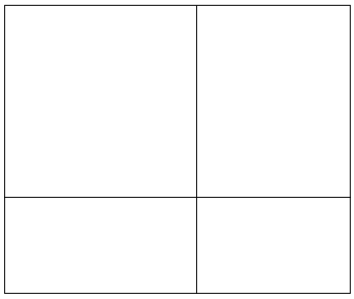
PART II: Factoring a difference of two squares.

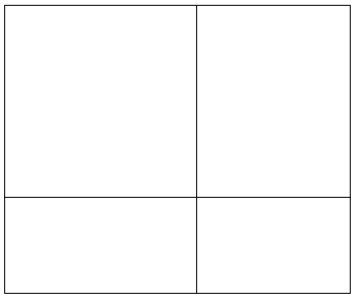
1. Use the same method as Part I to complete the following problems.

a. (x+3)(x-3)



Area/Solution:_____

b. (x-2)(x+2)



Area/Solution:_____

2. Factor each problem by determining what must have been multiplied to get the following areas.

a. $x^2 - 1$

x^2	
	-1

Factored form:_____

b. $x^2 - 16$

x^2	
	-16

Factored Form:_____

3. Predict:

a. Expand: (x-d)(x+d)= _____

b. Factor: $x^2 - d^2$ = _____

4. Explain with backwards foil why your predictions makes sense.

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PART III: Greatest Common Factors

1. List the factors of the following numbers.

   a. 16

   b. 24

   c. 100

   d. What is a factor? Write a definition. _____

_____

_____

2. List the factors of the following terms.

   a. $4x^2$

      Numeric factors:_____ Variable factors:_____

   b. $32x^5$

      Numeric factors:_____ Variable factors:_____

   c. $21xy$

      Numeric factors:_____ Variable factors:_____

   d. $9x^2yz^2$

      Numeric factors:_____ Variable factors:_____

3. For each expression, list the numeric and variable factors of both terms. What factors do they have in common?

   a. $2x^2 - 26$

      Factors of $2x^2$:_____

      Factors of 26:_____

      Common factors:_____

   b. $6x^2 + 18x$

      Factors of $6x^2$:_____

      Factors of 18x:_____

      Common factors:_____

   c. The GREATEST common factor (gcf) is the biggest factor both terms share. Choose the largest numeric factor and combine it with the largest variable factor to find the gcf for a. and b. above.

      a. gcf=_____ b. gcf=_____

   d. How can you rewrite the expressions in a. and b. in factored form using the gcf?

Factoring: GCF and DOTS Cornell Notes

OBJ:

Name:_____

Class:_____

Period:_____Date:_____

Topic: Factoring quadratic binomials using Greatest Common Factor (GCF) and Difference of Two Squares (DOTS)

Difference of Two Squares (DOTS)

1.

2.

Ex.:

1. $x^2 - 4$

2. $x^2 - 289$

3. $x^2 - 2$

3. $x^2 - 10$

Greatest Common Factor (GCF)

1.

2.

3.

Ex.:

1. $6x^2 + 3x$

Common Factors: GCF:

Factored Form: Check:

2. $-2x^2 - 8$

Common Factors: GCF:

Factored Form: Check:

3. $25x^2 - 10x$

When To Use GCF or DOTS

Ask yourself these questions:

1.

2.

Summary_____

_____

_____

_____

_____

_____

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7.7 Factoring: GCF and DOTS CW Date_____

Part I (DOTS): Factor each difference of squares.

1. $x^2 - 1$	2. $x^2 - 36$
3. $x^2 - 81$	4. $x^2 - 49$
5. $x^2 - 5$	6. $x^2 - 20$
7. Can you factor $x^2 + 24$ using the difference of squares method? Why or why not?	

Part II (GCF): Find the greatest common factor of the two terms in each expression and then factor.

1. $x^2 + 16x$ GCF _____ Factored Form:_____	2. $5x^2 + 45x$ GCF _____ Factored Form:_____

Honors Advanced Algebra

7.7 Factoring: GCF and DOTS CW

Name_____

Date_____

3. $6x^2 - 36x$ GCF _____ Factored Form:_____	4. $-3x^2 - 15x$ GCF _____ Factored Form:_____
5. $-7x^2 + 3x$ GCF _____ Factored Form:_____	6. $2x^2 - 10x$ GCF _____ Factored Form:_____
11. Can you use this method to factor $2x^2 + 13$? Why or why not?	

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7.7 Factoring: GCF and DOTS HW Date_____

Factor each expression below and **state what method** you are using to factor it.
OR explain why it **cannot** be factored by the methods we have learned.

1. $x^2 - 12$	2. $16x^2 + 48x$
3. $4x^2 + 9x$	4. $x^2 - 64$
5. $25x^2 + 9$	6. $4x^2 + 10x$
7. $-25x^2 + 45x$	8. $x^2 + 7$

9. Adriana takes a parachute and jumps out of an airplane to escape Calvin. Her height above the ground as a function of time (starting from when she jumped) is given by the equation

$$h=-(t^2 - 225)$$

a. How far up was the airplane when she jumped?

b. Factor this equation. What are it's x-intercepts? What do they mean in the context of the problem?