

## Opening 1/29/18

1. What are the factors of 12, 16, 8, and 21?
2. What are the factors of  $4x$ ,  $x^2$ , and  $12x$ ?
3. What are the factors of  $4x^2y$ , and  $8xy^2$ ?

$$12: 1, 2, 3, 4, 6, 12$$

$$16: 1, 2, 4, 8, 16$$

$$8: 1, 2, 4, 8$$

$$21: 1, 3, 7, 21$$

$$4x: 1, 2, 4, x$$

$$x^2: x, x$$

$$12x: 1, 2, 3, 4, 6, 12, x$$

$$4x^2y: 1, 2, 4, x, x, y$$

$$8xy^2: 1, 2, 4, 8, x, y, y$$

## Essential Question 1/29/18

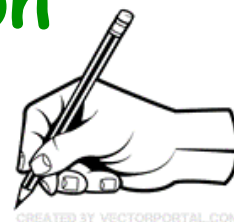
How can I find factors of a Quadratic Function?

### Standard

#### MGSE9-12.A.SSE.3a:

Factor any quadratic expression to reveal the zeros of the function defined by the expression.

# Factoring Greatest Common Factor (GCF).



Example 1: I do

Factor the GCF from each expression.

$$15x^4 + 3x^5$$

Handwritten notes for factoring  $15x^4 + 3x^5$ :

For  $15x^4$ : Factors of 15 are 1, 3, 5, 15. The GCF is 3. The variable part is  $x \cdot x \cdot x \cdot x$ .

For  $3x^5$ : Factors of 3 are 1, 3. The GCF is 3. The variable part is  $x \cdot x \cdot x \cdot x \cdot x$ .

$$15x^4 + 3x^5$$

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

## Example 2: I do



$$64a - 40ab$$

$$8a(8 - 5b)$$

## Example 3: You do



$$2x + 10$$

$$2(x+5)$$

## Example 4: You do

$$16x^2 + 24$$

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



## Example 5: You do

$$32x^4 - 8x^3 + 16x^2 = 0$$

$\cancel{xxxx}$     $\cancel{xxx}$     $\cancel{xx}$

Exponents: 4, 3, 2, 1, 0  
 GCF: 2

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

**Example 6: You do**

$$18x^4y^7 + 36x^3y^6 - 42x^5y^5$$

*(Note: Handwritten blue annotations show prime factorization of coefficients and exponents: 18 = 2 \* 3 \* 3, 36 = 2 \* 2 \* 3 \* 3, 42 = 2 \* 3 \* 7; 4 = 2 \* 2, 3 = 3, 5 = 5, 6 = 2 \* 3, 7 = 7)*

$$6x^3y^5(3xy^2 + 6y - 7x^2)$$

**Class Work 1**                      **1/29/18**

**Factoring Expressions by the  
GCF worksheet # 1 - 10.**

**HW: #1 - 12**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**UNIT 3 • MODELING AND ANALYZING QUADRATIC FUNCTIONS****Lesson 1: Creating and Solving Quadratic Equations in One Variable****Practice 3.1.2: Factoring Expressions by the Greatest Common Factor****A**

For problems 1–6, factor each expression by the greatest common factor if a common factor exists, or state that the terms have no common factor.

1.  $3x^3 + 5x^2$  *Alberto*  
 $x^2(3x + 5)$

2.  $2x^2y - 8xy^2$  *Amy*  
 $2xy(x - 4y)$

3.  $y^4 + 2y^2$  *Yuridssy*  
 $y^2(x^2 + 2)$

4.  $x^2 - 9x + 3$  *Dantes*  
 $1(x^2 - 9x + 3)$

5.  $x^3y^2 - 2x^2y^3 + 5xy^2$  *Robert*  
 $1xy^2(x^2 - 2xy + 5)$

6.  $7x - 21x^2y$  *Kendra*  
 $7x(1 - 3xy)$

Use what you have learned about factoring polynomials by the GCF to complete problems 7 and 8.

7. Christopher has two bags of marbles. The number of marbles in the first bag can be represented by the monomial  $45x^2y$ , and the number of marbles in the other bag can be represented by  $60x^3y^2$ . What is the GCF of these two monomials?

$45x^2y$   
 $60x^3y^2$   
 GCF =  $15x^2y$

8. An equilateral triangle has a perimeter of  $(15x^3 + 33y^2)$  feet. What is the length of each side?

$5x^3 + 11y^2$

Use the following information to complete problems 9 and 10.

Samuel and Ariana are competing in a speed round for an open position on the math team. To win the spot, each student must factor the same polynomial expression,  $12xyz^2 + 16x^2y^2z - 32x^2yz$ , by finding the GCF.

9. Samuel's final result was  $2xyz(6z + 8xy - 16x)$ . Explain his error, if any.

X

10. Ariana's final result was  $4xyz^2(3x + 4xy - 8xyz)$ . Explain her error, if any.

X

$$4xyz(3z + 4xy - 8x)$$