

**Content and Language Objective:**

Students will use what they know about factoring to apply it to situations that involve mathematical operations.

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**Warm-Up**

1.  $15x^4y^3$  and  $75x^2y$

$$15x^2y$$

2.  $12s^3t$  and  $168s^6tv^2$

$$12s^3t$$

### **Content and Language Objective:**

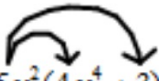
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Perhaps, the process of factoring by removing the greatest common factor can be best stated as the *reverse distributive property*. In the distributive property, one is multiplying a certain factor to all of the terms. In factoring by *GCF*, one is dividing all of the terms by the *GCF*.

Consider this expression which utilizes the distributive property:  $5x^2(4x^4 + 3)$ .

Visually, this is the distributive process:  $5x^2(4x^4 + 3)$ .



To simplify using the distributive property,  
one multiplies  $5x^2$  times  $4x^4$ , and then  
one multiplies  $5x^2$  times 3.

$$5x^2 \cdot 4x^4 = 20x^6$$

$$5x^2 \cdot 3 = 15x^2$$

After simplifying using the distributive property, you get  $\boxed{20x^6 + 15x^2}$ .

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When we are working through mathematical operations involving factoring, we approach it in much the same way we did with factoring only now we have mathematical operations involved.

Find the greatest common factor for the following.

$$24x^8 + 21x^3$$

24: 1, 2, 3, 4, 6, 8, 12, 24

21: 1, 3, 7, 21

$$3x^3(8x^5 + 7)$$

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**Find the greatest common factor:**

$$8y^2 - 12y^3 + 4y$$

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

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Find the greatest common factor:

$$14z^8 + 24z^7 - 30z^3$$

2

$$2z^3(7z^5 + 12z^4 - 15)$$

$$2z^3(7z^5 + 12z^4 - 15)$$

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Find the greatest common factor:

$$\underline{16c^7 - 6c^3}$$

$\div 2$

$$2c^3(8c^4 - 3)$$

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Students will find the greatest common factor in algebraic expressions involving one or more variables.

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**Warm-Up**

**Factor the following**

$$-15d^5 + 45d^3$$

$$15d^3(d^2 + 3d) \\ -15d^3(-d^2 - 3)$$

$$18p^3 - 63p^2 - 9p$$

$$9p(2p^2 - 7p - 1) \\ -9p(-2p^2 + 7p + 1)$$

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**When factoring the greatest common factor of an algebraic expression that involve multiple variables, you will approach it in the same ways that you did when there was only one variable.**

$$28r^4s^6 + 49r^2s^4 - 63r^2s^3$$

$$7r^2s^3(4r^2s^3 + 7s - 9)$$



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$$28a^3b^2 - 36a^2 - 17b^5$$
$$1(28a^3b^2 - 36a^2 - 17b^5)$$

**Since there is only a GCF of 1 and the terms do not all share any common variables this expression is PRIME. So whenever you have this situation will be known as PRIME**

