Name: _____ Date: _____

How can I use the GCF to write equivalent expressions?

Review

The greatest common factor, or GCF, of two monomials is the highest-degree monomial that is a factor of each term of the polynomial.

Determine the greatest common factor of $12x^2y^3$ and $15xy^4$.

First, find the GCF of the coefficients, 12 and 15.

Write each number as the product of prime factors.

$12 = (2)(2)(3)$ $15 = (3)(5)$

GCF = 3

Next, find the GCF of x^2y^3 and xy^4.

$x^2y^3 = (x)(x)(y)(y)(y)$ $xy^4 = (x)(y)(y)(y)(y)$

GCF = xy^3

The GCF of the terms is the product of the GCF of the coefficients and the GCF of the variable component.

The GCF of $12x^2y^3$ and $15xy^4$ is $3xy^3$.

Find the GCF of $7x$, $8y$, and $21y$.

Find the GCF of 7, 8, and 21.

$7 = (7)$ $8 = (2)(2)(2)$ $21 = (3)(7)$

GCF = 1

Find the GCF of x, y, and y.

$x = (x)$ $y = (y)$ $y = (y)$

GCF = 1

Terms are relatively prime when their GCF is 1.

The GCF of $7x$, $8y$, and $21y$ is 1. The terms are relatively prime.

Practice

Find the GCF of each set of terms. If the GCF is 1, write *relatively prime*.

1. $14ab^3$ and $7a^2b^2$

   GCF of 14 and 7: _____

   GCF of ab^3 and a^2b^2: _____

   Answer: _____

2. $4xy$, $12x^2y$, and $16x^3y^4$

   GCF of 4, 12, and 16: _____

   GCF of xy, x^2y, and x^3y^4: _____

   Answer: _____

3. $9h^3k^4$, $10j^7$

   Answer: _____

4. $36s^3t^3$, $18s^3t^5$, $24s^6t^3$

   Answer: _____

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Review

You can use the distributive property to factor a polynomial.

Factor $8x^2 + 2x$.

Step 1: The GCF of $8x^2$ and $2x$ is $2x$.

Step 2: Write each term as a product of $2x$ and another factor.

$$8x^2 + 2x = 2x(4x) + 2x(1)$$

Step 3: $2x(4x) + 2x(1) = 2x(4x + 1)$

Factoring an Expression

Step 1: Find the GCF of all of the terms.

Step 2: Write each term as a product, where one factor is the GCF.

Step 3: Use the distributive property.

You can check your answer by multiplying.

$$2x(4x + 1) = 2x(4x) + 2x(1) = 8x^2 + 2x$$

The factored form of $8x^2 + 2x$ is $2x(4x + 1)$.

Practice

Factor each expression.

1. $4x^5 + 32y$

   Step 1: The GCF of the terms is _____.

   Step 2: $4x^5 + 32y =$ _____$(x^5) +$ _____$(8y)$

   Step 3: _____$(x^5 + 8)$

2. $15p^4q - 60q^3$

   Step 1: The GCF of the terms is _____.

   Step 2: _____

   Step 3: _____

3. $16r^3s^4 + 48rs^2 =$ _____

4. $19w^2v^6 - 3w^3v^2 - w^4 =$ _____

5. $27a^9b^4 - 36a^8b^5 + 18a^7b^6 =$ _____

How do you factor a polynomial using the GCF?