

1-1 Greatest Common Factors (GCF)

Objectives:

1-1a: I can factor using a greatest common factor.

1-1b: I can solve multi-step equations.

1-1c: I can solve equations by factoring.

Nov 24-9:07 PM

Find the greatest common factor (GCF) of the terms

$$4x, 12 \qquad 6x^3, 12x^2, 15x$$

$1, 2, 4, x$ (circled 4)
 $1, 2, 3, 4, 6, 12$
 $3x$

$$4x^3y^4, 8x^2y^3, 12xy^2$$

$$4xy^2$$

Dec 6-9:31 AM

You Try

Find the greatest common factor (GCF) of the terms

$$3x^3y^5, 9x^2y^3, 12xy^4$$

$$3xy^3$$

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Factor out the GCF

$$\begin{array}{l} \text{GCF} \\ \swarrow \\ 4a^2b^2 - 10ab^3 + 18a^3b^4 \\ 2ab^2 (2a - 5b + 9a^2b^2) \end{array}$$

Multiply the GCF back into the expression.

What did you notice? *Factoring is pulling apart*
Distribution is putting together
They are opposites!

Dec 6-9:43 AM

You Try

Factor out the GCF

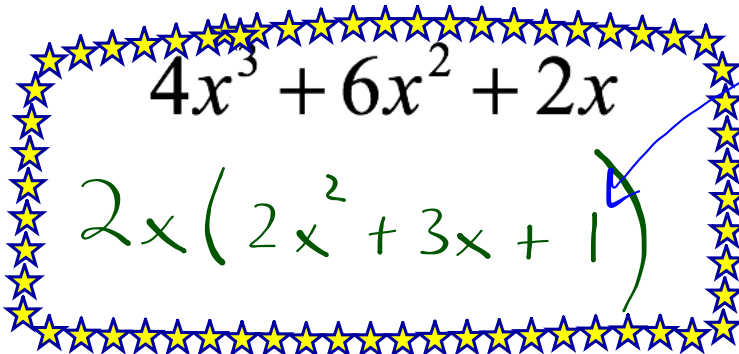
$$6y^3 - 14y^2 + 10y$$

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

Check by multiplying the GCF back into the expression.

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Factor out the GCF


$$4x^3 + 6x^2 + 2x$$
$$2x(2x^2 + 3x + 1)$$

Don't forget
the one!

$$3x^4 + 3x$$

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

Dec 2-1:47 PM

What happens if pull out a negative GCF compared to a positive GCF?

Pull out the negative with GCF

(only if it's the leading coefficient)

Factor out the GCF.

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

$$-2b(b^2 - 5b - 4)$$

1st term

$$-16x^2 + 4x$$

$$-4x(4x - 1)$$

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You Try

Factor out the GCF

$$-5y^2 + 10y$$

$$-5y(y - 2)$$

Dec 6-9:47 AM

Factor out the Greatest Common Binomial Factor

$$\underline{4x(x-3)} + \underline{5(x-3)}$$

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

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

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

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You Try

Factor out the Greatest Common Binomial Factor

$$4a(a-3) + 3(a-3)$$

$$(a-3)(4a+3)$$

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Solving by Factoring

Standard Form: $ax^2 + bx + c = 0$

$8x^2 + 4x = 0$
 $4x(2x + 1) = 0$

$4x = 0$
 $x = 0$

$2x + 1 = 0$
 $2x = -1$
 $x = -\frac{1}{2}$

$\sqrt{4} = 2$
 $= -2$

$(3a^3) = 9a^2$
 $\frac{-9a^2 - 9a^2}{3a^3 - 9a^2} = 0$
 $3a^2(a - 3) = 0$

$3a^2 = 0$
 $\sqrt{a^2} = \sqrt{0}$
 $a = 0$

$a - 3 = 0$
 $a = 3$

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$$-2x^2 + 4x = 0$$

$2n^2 = n$
 $\frac{-n - n}{2n^2 - n} = 0$
 $n(2n - 1) = 0$

$n = 0$

$2n - 1 = 0$
 $n = \frac{1}{2}$

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Solving Multi-Step Equations

$$\begin{array}{r} 3k - 7 = 5k + 11 \\ -3k \quad -11 \quad -3k \quad -11 \\ \hline -18 = 2k \end{array}$$

$$k = -9$$

$$-5g - 7 = 2g - 4$$

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$$\begin{array}{r} 7x - 10 = 2(x - 4) \\ 7x - 10 = 2x - 8 \\ -7x + 8 \quad -7x + 8 \\ \hline -2 = -5x \\ \underline{-5} \quad \underline{-5} \end{array}$$

$$x = \frac{2}{5}$$

$$7(y + 3) = 2y - 7$$

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$$\frac{1}{2}x + 5 = 12$$

-5 -5

~~$$2 \cdot \frac{x}{2} = 7 \cdot 2$$~~

$$x = 14$$

~~$$7 - \frac{3}{7}x = 11$$~~

-7 -7

~~$$-\frac{3}{7} \cdot \frac{x}{1} = -\frac{3x}{7}$$~~

~~$$7 - \frac{3x}{7} = 4 \cdot 7$$~~

~~$$-3x = 28$$~~

$$x = -\frac{28}{3}$$

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