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.

Bell Work: Find the greatest common factor (GCF) of the terms

1. $4x, 12$

$4 \cdot x$, $4 \cdot 3$

$x, 3$

GCF: 4

2. $6x^3, 12x^2, 15x$

$3 \cdot 2x^3$, $3 \cdot 4x^2$, $3 \cdot 5x$

GCF $= 3x$

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

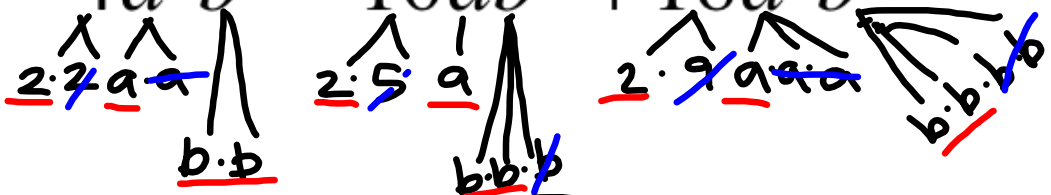
Find the greatest common factor (GCF) of the terms

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

Factor out the GCF

$2ab^2$

$$4a^2b^2 - 10ab^3 + 18a^3b^4$$



Multiply the GCF back into the expression.

$$2ab^2(2a - 5b + 9a^2b^2)$$

What did you notice?

$$4a^2b^2 - 10ab^3 + 18a^3b^4$$

You Try

Factor out the GCF

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

Check by multiplying the GCF back into the expression.

Factor out the GCF

$$4x^3 + 6x^2 + 2x$$

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

$$3x^4 + 3x$$

$3x(x^3+1)$

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

Factor out the GCF.

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

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

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

You Try

Factor out the GCF

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

$-5y(y-2)$

$-5y^2+10y$ ✓

Factor out the Greatest Common Binomial Factor

2 parts $(x-3)$

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

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

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

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

You Try

Factor out the Greatest Common Binomial Factor

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

Solving by Factoring

EQUAL SIGN

(x = somefin)

$8x^2 + 4x = 0$

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

Set $4x = 0$

Set $2x+1 = 0$

Then solve.

$3a^3 = 9a^2$

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

$a = 3$

CHECK

$3 \cdot 3^3 = 9 \cdot 3^2$

$3^4 = 3^2 \cdot 3^2$

$3^4 = 3^4$

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

$2n^2 = n$

Solving Multi-Step Equations

$3k - 7 = 5k + 11$ $k = -9$

$-5g - 7 = 2g - 4$ $g = -\frac{3}{7}$

$+5g \quad +5g$

$-7 = 7g - 4 \rightarrow -3 = 7g$

$+4 \quad +4$

$\frac{-3}{7} = \frac{7g}{7}$

$-\frac{3}{7} = g$

$7x - 10 = 2(x - 4)$

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

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

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

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

$$-3x=28$$

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