

ctor

$$\frac{6}{1} = 12$$

tors

$$\underline{3x} + \underline{24}$$

$$3 \cdot x + 3 \cdot 8$$

$$3(x + 8)$$

$$\begin{array}{r} \text{Che} \\ \overline{3(x)} \\ 3x \end{array}$$

8.5 Using the Distributive Property

Objective: I can use the distributive property to factor polynomials

Language Objective: I can use the vocabulary terms factor, distributive property, zero product property, and roots

Factoring: To express a polynomial as the product of monomials and polynomials

ex: $(3x + 5)(3x - 10)$

multiply/dividing

Since you are using the distributive property you'll use operations.

Commutative + assoc

ex. Use the Distributive Property to factor each polynomial.

$$27y^2 + 18y$$

$$3 \cdot 9 \cdot y \cdot y + 2 \cdot 9 \cdot y$$
$$9y(3y + 2)$$

-2 · 2a · b 2 · -4 · b · b

$$-4a^2b - 8ab^2 + 2ab$$

$$2ab(-2a - 4b + 1)$$

Factor By Grouping

In order to factor by grouping the following conditions must exist:

- 4 or more terms
- grouped terms have common factors
- there are 2 common factors that are identical or additive inverses
(opposites)

Factor

$$\begin{aligned} & (4qr + 8r) + (3q + 6) \\ & \downarrow \quad \downarrow \quad \downarrow \\ & \underline{4r(q+2)} + \underline{3(q+2)} \\ & \downarrow \\ & (q+2)(4r+3) \end{aligned}$$

$$(2mk - 12m) + (4a - 7k)$$

$$\cancel{2m(k-b)} + \cancel{7(b-k)}$$

↖ additive
~~7~~ Inverse

$$2m(k-b) + -7(-b + k)$$

$$2m(k-b) + -7(k-b)$$

$$(k-b)(2m-7)$$

Solving Equations by Factoring

Zero Product Property: If the product of two factors is 0, then at least one of the factors must be 0.

9.

Symbols: If $ab=0$ then either $a=0$, $b=0$ or both equal zero.

Roots: are the x-intercepts of an equation

$$\begin{array}{l} \rightarrow (2d+6)(3d-15) = 0 \\ \swarrow \quad \searrow \\ \begin{array}{l} \downarrow +6 = 0 \\ -6 \quad -6 \\ \hline \frac{2d}{2} = \frac{-6}{2} \\ \hline d = -3 \end{array} \quad \text{OR} \quad \begin{array}{l} 3d - 15 = 0 \\ +15 \quad +15 \\ \hline \frac{3d}{3} = \frac{15}{3} \\ \hline d = 5 \end{array} \end{array}$$

We say
"-3 and 5 are
roots of the
means
-3 and 5 a

solving equations by factoring

$$8b^2 = 40b \quad \leftarrow$$

$-40b \quad -40b$

$\cdot b \cdot b$

$$\underline{8b^2} - \underline{40b} = 0$$

$$b(b-5) = 0$$

$$\frac{0}{8} = 0$$

OR

$$b - 5 = 0$$

$+5 \quad +5$

$$\boxed{b = 5}$$

AGILITY Penny is a Fox Terrier who competes with her trainer in the agility course. Within the course, Penny must leap over a hurdle. Penny's jump can be modeled by the equation $h = -16t^2 + 20t$, where h is the height of the leap in inches at t seconds. Find the values of t when $h = 0$.

on the ground

$$0 = -16t^2 + 20t$$

$$0 = 4t(-4t + 5)$$

$$\frac{-1t}{4} = \frac{0}{4}$$
$$t = 0$$

OR

$$-4t + 5 = 0$$

$$\frac{-4t}{-4} = \frac{-5}{-4}$$

$$t = 1.25$$

Penny will
on the ground
0 and 1.25 secc

