

The Distributive Property Guide Notes

DISTRIBUTIVE PROPERTY

For any numbers a , b , and c , the product of a and $(b + c)$ is:

$$a(b + c) = ab + ac$$

$$(b + c)a = ba + ca$$

For any numbers a , b , and c , the product of a and $(b - c)$ is:

$$a(b - c) = ab - ac$$

$$(b - c)a = ba - ca$$

Sample Problem 1: Rewrite using the distributive property, then evaluate.

a. $8(10 + 4) = 8 \cdot 10 + 8 \cdot 4 = 80 + 32 = 112$

b. $(5 + 7)12 = 5 \cdot 12 + 7 \cdot 12 = 50 + 84 = 134$

c. $5(100 - 72) = 5 \cdot 100 - 5 \cdot 72 = 500 - 360 = 140$

d. $\left(2 + \frac{1}{5}\right)35 = 2 \cdot 35 + \frac{1}{5} \cdot 35 = 70 + 7 = 77$

e. $(10 + 7)5 = 10 \cdot 5 + 7 \cdot 5 = 50 + 35 = 85$

TERM is a number, a variable or a product or quotient of numbers and variables.

LIKE TERMS are terms that contain the same variables, with corresponding variables having the same power.

SIMPLIFYING EXPRESSIONS:

Distributive property is used to combine like terms by adding their coefficients. A simplified expression must not have grouping symbols and fractions are reduced to its lowest term.

Sample Problem 2: Simplify.

a. $18x + 3x = 21x$

b. $5x^2 + 2 - x^2 = 4x^2 + 2$

c. $3 - 2(4 + x) = 3 - 2(4) - 2(x) = 3 - 8 - 2x = -5 - 2x$

d. $-3(2x^2 + 4x - 1) + 5x = -3(2x^2) - 3(4x) - 3(-1) + 5x = -6x^2 - 12x + 3 + 5x = -6x^2 - 7x + 3$

e. $5(x - 7y) + 8(3x + 2y) = 5(x) - 5(7y) + 8(3x) + 8(2y) = 5x - 35y + 24x + 16y = 29x - 19y$

Sample Problem 3: Manny runs a restaurant. One day, a total of 50 steaks are sold. Each steak cost \$14.95 and received an average tip of \$1 for each. Write the expression that determines the total amount he earned. How much did Manny earned?

$$\begin{aligned} &50(14.95 + 1) \\ &= 50(15.95) \\ &= \$797.5 \end{aligned}$$