1-5: The Distributive Property

Example 1: Julio walks 5 days a week. He walks at a fast rate for 7 minutes and cools down for 2. Use the distributive property to write and evaluate an expression that will determine the total number of minutes Julio walks.

5 days/wk → $5(7 + 2)$ ← minutes at fast rate; ← minutes of cool down

PEMDAS

$5 \cdot 9$	$5 \cdot 7 + 5 \cdot 2$
45	$35 + 10$
	45

→ distributive property

Are both ways mathematically correct? yes

A Key Belief of Arithmetic

The Distributive Property: If *a*, *b*, and *c* are real numbers, then $a(b+c) = ab + ac$.

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

Rewrite each expression using the distributive property. Then simplify.

a. $7(3w - 5)$

$7 \cdot 3w - 7 \cdot 5$

$21w - 35$

not like terms

b. $(8 + 4n)2$

$2(8+4n)$

$2 \cdot 8 + 2 \cdot 4n$

$16 + 8n$

not like terms

c. $4(6x^2 + x - 3)$

$4 \cdot 6x^2 + 4 \cdot x - 4 \cdot 3$

$24x^2 + 4x - 12$

not like terms

d. $(2 - 5q)(-3)$

$-3(2 - 5q)$

$-3 \cdot 2 - (-3) \cdot 5q$

$-6 - (-15q)$

$-6 + 15q$

not like terms

Example 2:

Roma says that collecting like terms can be seen as an application of the distributive property. Is writing $x + x = 2x$ an application of the distributive property? yes

$x + x = 1x + 1x = x(1+1) = x \cdot 2 = 2x$

This is the distributive property in reverse.

1-5

Example 3: Use the distributive property to prove that 2x + 3x = 5x.

$2x+3x = x(2+3) = x\cdot 5 = 5x$

Use the distributive property to rewrite each expression. Then evaluate.

a. 2(4+ x)

$2\cdot 4 + 2\cdot x$

$8+2x$

b. (g – 9)5 $= 5(g-9)$

$5\cdot g - 5\cdot 9$

$5g-45$

Simplify each expression. If not possible, write simplified.

a. 13r + 5r

$(13+5)\cdot r$

$18r$

b. $3x^3 + 2x^2$

not like terms

Simplified

c. 7m + 2m – 5p +4m

$7m+2m+4m-5p$

$(7+2+4)\cdot m - 5p$

$13m-5p$

d. 3x + 7(3x + 4)

$3x+7\cdot 3x+7\cdot 4$

$3x+21x+28$

$(3+21)\cdot x+28$

$24x+28$

Do you remember the following definitions??? Write a definition and give an example.

Like Terms:

Terms that contain the same variables, with corresponding variables having the same exponent.

5x and 5x
like terms

5x and 20
not like terms

Simplest Form:

An expression is in simplest form when it is replaced by an equivalent expression having no like terms or parentheses. $2(x+7) = 2x+14 \leftarrow$ simplest form

Coefficient: **The number in front of a variable.** $3y \leftarrow$ variable

coefficient

Term: **A number, a variable, or a product of numbers and variables.**

$y + 2x + 10$ (3 terms)

variable — product of a number and Variable — number