

Chapter 3: Solving Equations and Problem Solving

NO CALCULATOR!

Terms:

<u>coefficient</u>	<u>like</u>	<u>variables</u>
<u>constant</u>	<u>simplify</u>	
distributive	<u>terms</u>	
<u>expression</u>	<u>variable</u>	

1. An Algebraic expression is a combination of numbers, letters (variables), and operations symbols. $3x - 7$
2. Variables are letters that represent unknown quantities.
3. The distributive property shows when multiplication is distributed over addition or subtraction.
4. Simplify means to remove parenthesis and combine like terms
5. Addends of an algebraic expression are called terms of the expression.
6. A term that is only a number is called a constant term, or simply a constant.
7. A term that contains a variable is called a variable term.
8. The number factor of a variable term is called the numerical coefficient.
9. Terms with the same variable factors, except that they may have different numerical coefficients, are called like terms.

3.1 Simplifying Algebraic Expressions**3.1 Objective A: Use Properties of Numbers to Combine Like Terms.**

Distributive Property

If $a, b,$ and c are numbers, then

$$ac + bc = (a + b)c \quad \text{also,} \quad ac - bc = (a - b)c$$

Commutative Property (order changes)

Addition: $3 + 7 = 7 + 3$

Multiplication: $3 \cdot 7 = 7 \cdot 3$

~~*not subtraction/division~~

Associative property (grouping changes)

Addition: $3 + 7 + 1 = (3 + 7) + 1 = 3 + (7 + 1)$

Multiplication: $3 \cdot 7 \cdot 1 = (3 \cdot 7) \cdot 1 = 3 \cdot (7 \cdot 1)$

Ex. 1. Simplify each expression by combining like terms.

a. $8y + 3y$
 $11y$

b. $7z - 10z$
 $-3z$

c. $4c + 1c - 7c$
 $5c - 7c$
 $-2c$

Ex. 2. Simplify each expression by combining like terms.

a. $6y + 12y - 6$
 $18y - 6$

b. $-7y + 2 - 2y - 9x + 12 - x$
 $-9y + 14 - 10x = -10x - 9y + 14$

3.1 Objective B: Use Properties of Numbers to Multiply Expressions.

Ex. 3. Multiply

$-8(9x) = -72x$

Ex. 4. Use the distributive property to multiply.

a. $8(y + 2)$
 $8y + 16$

b. $3(7a - 5)$
 $21a - 15$

3.1 Objective C: Simplify Expressions by Multiplying and Then Combining Like Terms

Ex. 5 Simplify:

a. $5(2y - 3) - 8$

$10y - 23$

c. $2(3x + 1) + 5(x - 2)$

$11x - 8$

b. $3 + 6(w + 2) + w$

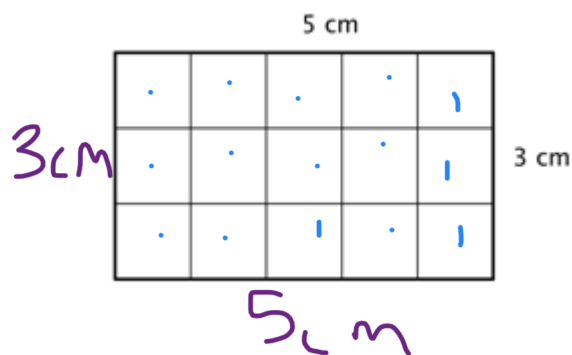
$7w + 15$

d. $-(2y - 6) + 10$

$-2y + 16$

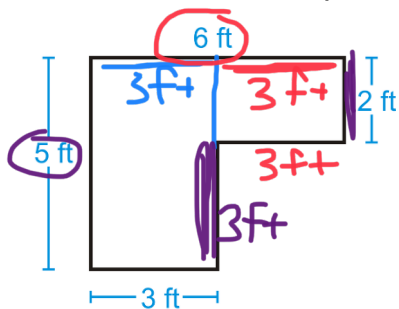
3.1 Objective D: Find the Perimeter and Area of Figures.**Definitions:**

1. Perimeter measures the distance around the figure and in units. (1-Dimensional)
2. Area measures the amount of surface in a region and is in **square** units. (2-Dimensional)

Ex. 6. Find the area and perimeter of the rectangle.

$$P: 5 + 3 + 5 + 3 = 16 \text{ cm}$$

$$A: 15 \text{ cm}^2$$

Ex. 7. Find the area and perimeter of the below figure.

$$P: 6 + 2 + 3 + 3 + 3 + 5 = 22 \text{ ft}$$

$$A: 5 \cdot 3 + 2 \cdot 3 = 15 + 6 = 21 \text{ ft}^2$$

$$A_{\text{rectangle}}: b \cdot h$$

Group Review: pg 171 #8, 10, 12, 14, 32, 34, 74, 80