

TOPIC: SIMPLIFYING EXPRESSIONS

Like Terms

◆ Recall: Algebraic expressions combine numbers and variables using operations. Ex: $2x + 5$

► The **terms** of an expression are the parts of an expression separated by ____ or ____ signs.

Like Terms	Not Like Terms
[SAME DIFFERENT] <i>variables</i> ____ <i>exponents</i> $4x^2$ and $7x^2$ $2ab$ and $8ba$ $5x^2yz$ and $-10x^2yz$	[SAME DIFFERENT] <i>variables</i> ____ <i>exponents</i> $4x^2$ and $7x^3$ $2a$ and $2ba$ $5x^2yz$ and $-10xy^2z$

◆ You can combine **like terms** by adding or subtracting their _____. You **CANNOT** combine **unlike terms**.

EXAMPLE

Combine like terms in the following expressions.

(A) $4x^2 + 7x^2$

(B) $2ab + 8ba$

(C) $5x^2yz$ and $-10xy^2z$

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EXAMPLE

In each expression, combine any like terms.

(A) $6a^2 + 8a^2$

(B) $7x^2 + 8x + 4$

EXAMPLE

Combine like terms such that each variable only appears once.

(A) $3p + (-9p) + 4 - 2 + p$

(B) $6z - 4 + 11z + 9$

PRACTICE

Simplify by combining like terms.

(A) $3b + 4b + b$

(B) $10x + 6 - 2x$

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Multiplying Expressions

◆ We can use the properties of multiplying *numbers* to multiply *expressions*.

Recall

Associative Property

$$a(b \cdot c) = (a \cdot b)c$$

Distributive Property

$$a(b + c) = a \cdot b + a \cdot c$$

EXAMPLE

Multiply.

(A) $3(2x)$

(B) $3(2 + x)$

(C) $2(4x - 5)$

PRACTICE

Multiply.

(A) $-5(7x)$

(B) $12(5b)$

(C) $6(8 + 9z)$

(D) $-1(y + 2x + 3)$

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Simplify Expressions

◆ An algebraic expression is *fully simplified* when there are ____ parentheses & all like terms have been _____.

EXAMPLE

Simplify the following expressions.

(A) $2(3 + 5x) + 7$

(B) $3(2x + 4) - (5 + 8x)$

HOW TO: Simplify Algebraic Expressions

- 1) **Multiply** using distributive prop. to remove ()
- 2) **Identify** like terms (*same variable/same exponent*)
- 3) **Group** like terms by writing _____ each other
- 4) **Combine** like terms (+ / - _____)

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PRACTICE

Simplify the expression.

(A) $-3(x + 6) + 5(11 - 9x)$

(B) $8 + 6(5 - 3y)$

(C) $11a + 5 - 3b + 2a + 9b$

(D) $2c + 3(7 + c) - 9$

HOW TO: Simplify Algebraic Expressions

- 1) **Multiply** using distributive prop. to remove ()
- 2) **Identify** like terms (*same variable/same exponent*)
- 3) **Group** like terms by writing next to each other
- 4) **Combine** like terms (+ / - coefficients)