



Chapter 5

Algebraic Expressions

5-1A: Numerical Expressions

Main Idea: Find the value of expressions using the order of operations

CCSS: 6.EE.1

Vocabulary:

Operation - multiply, divide, add, subtract

Numerical expression - a combination of numbers and operations

Order of operations - the order in which you simplify an expression

In most languages, the meaning of words depend on the order:

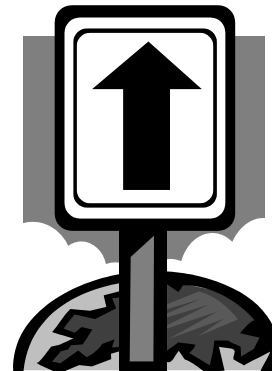
Ex.

Sign the check



Is not the same as

Check the sign



Mathematics is a type of language with its own syntax and grammar.

$$\text{Ex. } 3 + 5 \times 2$$

What do we do first? Add or multiply?

If we add first:

$$\begin{array}{c} 3 + 5 \times 2 \\ \underbrace{\quad\quad\quad} \\ 8 \times 2 \\ \underbrace{\quad\quad\quad} \\ 16 \end{array}$$

If we multiply first:

$$\begin{array}{c} 3 + 5 \times 2 \\ \underbrace{\quad\quad\quad} \\ 3 + 10 \\ \underbrace{\quad\quad\quad} \\ 13 \end{array}$$

Uh Oh! Which one is the correct answer?



What is PEMDAS?

In order to make sure every person gets the same answer to a math problem, mathematicians came up with a rule called the order of operations

Parenthesis () []

Exponents 2^3

Multiplication X

Division ÷

Addition +

Subtraction -

In order from left to right!

In order from left to right!

AKA **GEMA**

G - grouping symbols

E - exponents (powers)

M - multiply and divide from left to right

A - add and subtract from left to right

Examples:

$$1) 4 + 2 \times 10$$

$$2) 15 - 3 + 4$$

$$3) 2 \times 10 \div 5$$

$$4) 20 \div 5 \times 2$$

More examples:

$$20 \div 4 + 17 \times (9 - 6)$$

$$3 \times 6^2 + 4$$



Homework:

Workbook p. 71



5-1B: Algebra - Variables and Expressions

Main Idea: Evaluate algebraic expressions

CCSS: 6.EE.2, 6.EE.2b, 6.EE.2c, 6.NS.6

Vocabulary:

Variable - a symbol (letter) that represents a number.

Algebraic expressions - a combination of at least one variable and one operation.

Examples:

1) Evaluate $16 + b$ if $b = 25$

2) Evaluate $a - b$ if $a = 6$ and $b = 15$

3) Evaluate $16y + z$ if $y = 2$ and $z = 3$

More examples:

1) $c^2 + a$ if $a = 4$ and $c = 9$

2) $st \div 6r$ if $r = 5$, $s = 32$, $t = 45$


3) $(3a - 4) \div (bc - d)$ if $a = 4$, $b = 4$, $c = 4$, $d = 12$



Homework:

Group 1: #1-25 odd

Group 2: #9-35 odd



5-1B part 2: Like Terms

Main Idea: combine like terms

Vocabulary:

Term - a number variable, or combination of both

Like terms - terms that have the same variable parts

Constant - a term without a variable (a number)

Add and subtract like terms

Steps:

- 1) Add or subtract any constants
- 2) Add or subtract the number part of any like terms
- 3) Keep the variable the same

Examples: Combine like terms (simplify)

1) $3x + 2 - 1x$

2) $4c + 8f + 3c + 6 - 2$

3) $3h + 5 - 8j - 2 + 4h - 3j$



Homework:


p.278 #52-60

5-1C/D: Write Expressions

Main Idea: Use models to write expressions; write verbal phrases as simple algebraic expressions

Steps to Write Expressions:

- ✓ Read the story problem carefully.
- ✓ Define your variable
 - Assign a letter to represent what you don't know
- ✓ Use cluewords to determine the operation.



Example: Sam sent 10 fewer texts in July than in August. Write an algebraic expression to represent the number of texts sent in July.

Example: John's family drove three times as many miles on Saturday as they did Friday. Write an expression to represent the number of miles driven on Saturday.



Trickiest part is the key words:

four less than a number

The quotient of 16 and a number



Homework:

p.284 #6-17

5-2A: Algebra Properties

Main Idea: Use the Commutative, Associative, and Identity Properties to simplify expressions



Graphic Organizer



Homework:

Workbook p. 79



5-2C: The Distributive Property

Main Idea: Model and use the distributive property

Distributive Property:

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

Note: when there is no operation sign, just multiply

Examples:

1) $16(2 + c)$

2) Simplify $2 \cdot 3.6$

3) $2(x + 8)$

Which statement demonstrates the distributive property **incorrectly**?

1. $3(x + y + z) = 3x + 3y + 3z$
2. $(a + b) c = ac + bc$
3. $5(2 + 3x) = 10 + 3x$
4. $6(3k - 4) = 18k - 24$

Answer Now



Homework:

Workbook p. 81



PRACTICE TEST



Chapter 5 Test