



Chapter 4

Multi-Step Equations and Inequalities



4-1A Properties

Main Idea: Identify and use mathematical properties to simplify algebraic expressions.

Graphic Organizer Handout





Homework:

p.223 #1 - 24



4-1B Distributive Property

Main Idea: Apply the Distributive Property to rewrite algebraic expressions

Distributive Property:

to multiply a sum or difference by a number, multiply each term inside the parentheses by the number outside the parentheses.



Examples: Use the distributive property to evaluate each expression.

1) $7(3 + 12)$

2) $(8 - 5)11$



Equivalent Expressions: expressions that have the same value

*Using the distributive property creates equivalent expressions

Examples: Use the distributive property to rewrite each expression

1) $(a + 9)4$

2) $8(3 - t)$

3) $-7(x - 10)$



Homework:

p.227 #14-44 even



4-1C Simplify Algebraic Expressions

Main Idea: Simplify algebraic expressions

Vocabulary:

- **Term** - a number, variable, or combination of a number and variable (aka 'the stuff we add')
- **Coefficient** - the factor of a variable (number multiplying variable)
- **Like terms** - terms with the same variable to the same power; only like terms can be combined
- **Constant** - term without a variable

Identify the terms, like terms, coefficients, and constants in the expression $3x - 5 + 2x - x$

Simplest form: has no like terms and no parentheses

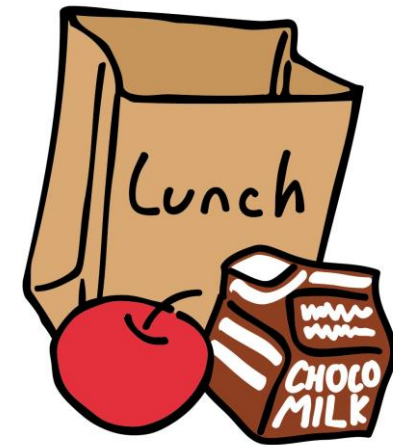
$$\text{Ex. } 4y + y = 4y + 1y = (4 + 1)y = 5y$$

Examples: Write each expression in simplest form.

1) $6n - n$

2) $8z + z - 5 - 9z + 2$

Real World Example: Alec has money for lunch. Jack has \$3 more than Alec. Write an expression in simplest form that represents the total amount of money they have.





Homework:

p. 233 #2 - 38 even

4-2B Solve Equations with Variables on Each Side


Main Idea: Solve equations with variables on each side

CCSS: 8.EE.7, 8.EE.7b


How to solve $3x + 2 = 4x - 1$?

- Need to get all variable terms on one side, constants on the other
- Doesn't really matter which side, but like to have a positive coefficient
- Show each step of your work!!


$$3x + 2 = 4x - 1$$



Solve $8y - 9 = -3y + 2$



Example: Define a variable, write an equation, and solve

Eleven more than four times a number is twice the number.

Exit Slip: Solve $3x + 5 = 6x + 2$ and explain the procedures you used to solve the equation.

*use a half sheet of paper





Homework:

p.243 # 9-33 odd, 36


4-2C/D Solve Multi-Step Equations and Inequalities

Main Idea: solve multi-step equations and inequalities

CCSS: 8.EE.7, 8.EE.7b

How do we simplify and solve equations with multiple steps?

- To solve equations with multiple steps, **first** use the distributive property to get rid of the parentheses.
- **Then**, combine like terms to get the problem in the 2-step form.
- **Solve by using inverse operations** as you do with 2-step equations.



Example: Simplify and solve $3x + 2(2x - 1) = 33$



Example: Simplify and solve $3(x - 2) + 4x = 8$


Example: Simplify and solve
 $-5x + 3 - (9x - 2) + 7 = 96$

Multi-Step Inequalities:

- Similar to solving multi-step equations
- Use inequality properties



Example: Solve $7(v + 5) > 56$



Example: Solve $-4d + 2(d + 5) < 12$



Homework:

Worksheet



Chapter 4 Test