

LINEAR EQUATIONS

NAME: ANSWER KEY

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Guide to Solving Linear Equations:

1. **Distributive Property:** multiply each outside term(s) to the terms inside the parenthesis.
2. **Combine Like Terms:** A common technique for simplifying algebraic expressions by adding or subtracting common terms by their coefficients.
3. **Move all variable terms to one side of the equation:** Use addition or subtraction to get all terms with the variable on one side of the equation and all constant terms on the other side. (Think about *Inverse Operations*)
4. **Isolate the variable:**
 - a. Add or subtract any constants to get the variable by itself.
 - b. If the variable has a coefficient other than 1, divide or multiply both sides of the equation by the coefficient to solve for the variable(s).
5. **Check your solution:** Substitute the solution back into the original equation to ensure makes the equation is true.

LINEAR EQUATIONS

Techniques

1. Combine like Terms

Like and Unlike Algebraic Terms



Like Term

$$8x + 12x$$

Unlike Term

$$6xy - 20y$$

2. Inverse Operations

Operation	Inverse Operation
Addition	Subtraction
Subtraction	Addition
Multiplication	Division
Division	Multiplication

A decorative illustration at the bottom of the table. On the left is a small orange pot containing a purple pen, a green pencil, and a blue ruler. In the center is a blue and orange pencil lying horizontally. On the right is the "SplashLearn" logo in a bold, black, sans-serif font. The entire illustration is set against a light purple background with soft, wavy lines.

3. Distribution Property

LINEAR EQUATIONS

Distributive Property Formula

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

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

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

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

4. PEMDAS

ORDER OF OPERATIONS			
The order of operations tells you the sequence to follow when you are performing operations in a mathematical expression.			
P	E	M D	A S
1	2	3	4
Parentheses	Exponents	Multiply or Divide	Add or Subtract
()	a^2	X or \div	+ or -
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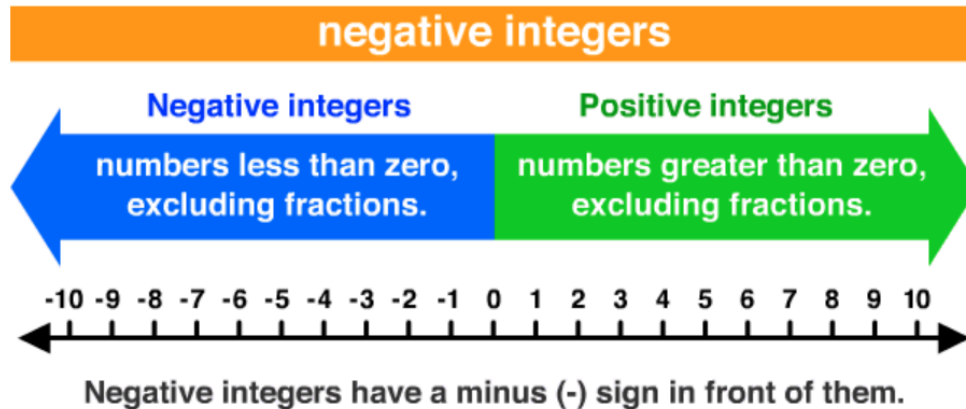
LINEAR EQUATIONS

5. Negative Numbers

negative integer

- a number less than zero, but not a fraction or a decimal fraction.
- written with a minus sign.

EXAMPLES:



operations on positive and negative integers

Addition

Positive + Positive = Positive	$5 + 3 = 8$
Negative + Negative = Negative	$(-5) + (-3) = -8$
* Positive + Negative or Negative + Positive	$(-5) + 3 = -2$
• subtract the smaller number from the larger number, then use the sign of the larger number in the answer	$3 + (-5) = -2$
	$(-3) + 5 = 2$
	$5 + (-3) = 2$

Subtraction

Negative - Positive = Negative	$(-5) - 3 = (-5) + (-3) = -8$
Positive - Negative = Positive	$5 - (-3) = 5 + 3 = 8$
* Negative - Negative = Negative + Positive	$(-5) - (-3) = (-5) + 3 = -2$
• treat as Negative + Positive	$(-3) - (-5) = (-3) + 5 = 2$
• subtract the smaller number from the larger number, then use the sign of the larger number in the answer	

Multiplication

Positive x Positive = Positive	$5 \times 3 = 15$
Negative x Negative = Positive	$(-3) \times (-5) = 15$
Negative x Positive = Negative	$(-3) \times 5 = -15$
Positive x Negative = Negative	$3 \times (-5) = -15$
• change double negatives to a positive	

Division

Positive ÷ Positive = Positive	$15 \div 3 = 5$
Negative ÷ Negative = Positive	$(-15) \div (-3) = 5$
Negative ÷ Positive = Negative	$(-15) \div 3 = -5$
Positive ÷ Negative = Negative	$15 \div (-3) = -5$
• change double negatives to a positive	