

Module 3 - Lesson 1: Evaluating Equations

Directions for Guided Notes - Complete these notes before each live lesson. You may print or store them digitally. Click on the video links in the right-hand column as they provide the answers needed for the left-hand column.

Notes	Space for NOTES & Video Links
Vocabulary coefficient: the number or constant that multiplies a variable in an _____ expression; if no number is specified, the coefficient is ____ distributive property: a property that is used to _____ a single term with two or more terms inside a set of _____ equation: a mathematical sentence that shows two _____ are equal using the equal sign integer: whole numbers and their _____ variable: a letter used to represent an unknown _____	
Steps to Determine Which Solution Is True for a Given Equation Step 1 Replace each variable in the equation with one integer from the solution set. Step 2 Simplify the expressions on both sides of the equation.	

Step 3 Determine whether the ending equation is true or false. • If it is true, the number is a solution for the equation. • If it is false, the number is not a solution for the equation. Step 4 Repeat for all values in the solution set.	
Steps for following the Order of Operations Step 1 Simplify inside parentheses () or other grouping symbols [], using order of operations. Step 2 Simplify terms with exponents. Step 3 Multiply or divide from left to right. Step 4 Add or subtract from left to right.	

Module 3 - Lesson 2: Solving One-Step Equations with Integers

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Notes	Space for NOTES & Video Links
Vocabulary additive inverse property: the sum of any number and its _____ is 0 addition property of equality: when adding or subtracting the same number on both sides of an _____, the sides will remain _____ commutative property of addition: _____ can be completed in any order without changing the sum equation: a mathematical sentence that shows two _____ are equal using the _____ sign identity property of addition: $a + 0 = a$ and $0 + a = a$, where a is a real _____ integer: whole numbers and their _____ number line: a straight line with tick marks along its length to indicate _____ of numbers	

In order to keep an equation balanced when solving for a variable, you must perform the same operation to both sides of the equation.

Addition and subtraction are inverse operations.

Multiplication and division are inverse operations.

When solving an equation:

- **start by looking at the side of the equation with the variable on it**
- **determine what operation is being performed with the variable**
- **perform the inverse operation to both sides of the equation**
- **simplify both sides until the variable is the only thing left on one side of the equals sign**

Module 3 - Lesson 3: Writing One-Step Equations with Integers

Notes	Space for NOTES & Video Links
Vocabulary equation: a mathematical sentence that shows two _____ are equal using the equal integers: whole numbers and their _____ substitution: replacing _____ in an expression or equation with values or numbers	
When writing equations, you can translate the statement using key words. When solving equations, remember to use the inverse operation to isolate the variable. Addition • plus • sum • more than • increased • total Subtraction • minus • difference • less than • decreased by • left over	

Multiplication • times • product • twice • of Division • quotient • half • split	
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Properties of Addition and Subtraction

Property	Description	Example
Additive Inverse Property	the sum of any number and its opposite is 0 $x + -x = 0$	$3 + (-3) = 0$
Addition Property of Equality	adding the same number to both sides of the equation does not change the equation if $x = y$ then $x + z = y + z$	$x - 8 = 12$ $x - 8 + 8 = 12 + 8$ $x = 20$

Associative Property	the sum of three numbers is not affected by how they are grouped $x + (y + z) = (x + y) + z$	$2 + (3 + 4) = (2 + 3) + 4$ $2 + (7) = (5) + 4$ $9 = 9$
Commutative Property of Addition	addition can be completed in any order without changing the sum $x + y = y + x$	$6 + 7 = 7 + 6$ $13 = 13$
Identity Property of Addition	if 0 is added to any number, the answer is the original number $x + 0 = x$	$18 + 0 = 18$
Substitution Property of Equality	if two variables or values are equal, you can replace one value with the other If $x = y$ and $y = z$ then $x = z$	$x = 4 \text{ and } x + 5 = 9$ 4 can be substituted for x $4 + 5 = 9$
Subtraction Property of Equality	if $x = y$, then $x - z = y - z$	$x + 9 = 15$ $x + 9 - 9 = 15 - 9$ $x = 6$

Properties of Multiplication and Division

Property	Description	Example
Commutative Property of Multiplication	numbers can be multiplied in any order and the product will be the same $xy = yx$	$(2)(3) = (3)(2)$ $6 = 6$
Division Property of Equality	if you divide both sides of the equation by the same number, the equation remains equal if $x = y$, then	$5x = 20$ $\frac{5x}{5} = \frac{20}{5}$ $x = 4$
Identity Property of Multiplication	if 1 is multiplied by any number, the answer is the original number	$1(8) = 8$
Multiplication Property of Equality	if you multiply both sides of the equation by the same number, the equation remains equal if $x = y$, then $xz = yz$	$\frac{d}{6} = 42$ $(6)\frac{d}{6} = 42(6)$ $d = 252$

****HINT:** If you have completed all parts above, you have just completed the 3.03 notes!!!

You can now click on the 3.03 assessment and your NEW notes will help you succeed!

Module 3 - Lesson 4: Solving One-Step Equations with Rational Numbers

Notes	Space for NOTES & Video Links
Vocabulary difference: the answer when one number is – from another dividend: the being divided divisor: the number by which the _____ is being divided equation: a real number that can be expressed as the _____ of two _____ rational number: a real number that can be expressed as the of two integers	
You can use mental math and math facts to help determine the answer for an equation. When mathematically reasoning through an equation to determine the value of the variable, you may consider the following: • mental math and math facts • signs (positive or negative) • whether the variable is greater than, less than, or within a range of given values in the equation • the type of number the variable should be (whole number, fraction, decimal number) based on the problem	

When solving equations, remember to use the inverse operation to isolate the variable.	
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Module 3 - Lesson 5: Translating Algebraic Inequalities

Notes	Space for NOTES & Video Links
Vocabulary inequality: a mathematical sentence that uses $>$, $<$, $\geq$, $\leq$ symbols to compare two _____	
Common Words and Phrases for Writing Inequalities greater than $>$ - greater than - more than - larger than - exceeds - above less than $<$ - less than - smaller than - fewer than - lower than greater than equal $\geq$ - at least - no less than - a minimum - no fewer than less than equal $\leq$ - no more than - at most - a maximum	

Graphing Inequalities

Step 1

Identify the constant number in the inequality. This number tells you where your graph will start.

Step 2

Use the symbol to create a graph for the inequality. The symbols tells you two things about your graph:

- the type of circle used at the starting point of your graph
- direction of the line, showing the numbers included in the solution set

Toolbox Tutor: [Translating Inequalities Tutorial](#) (3:05)

Symbol	Meaning	Number Line
$x > n$	greater than	
$x < n$	less than	
$x \geq n$	greater than or equal to	
$x \leq n$	less than or equal to	

Module 3 - Lesson 6: Evaluating Inequalities

Notes	Space for NOTES & Video Links
Vocabulary coefficient: the number or constant that multiplies a variable in an algebraic expression; if no number is specified, the _____ is 1 distributive property: an algebraic property that is used to _____ a single term and two or more terms inside a set of _____ integers: _____ numbers and their opposites variable: a _____ that represents a number	
Steps for Determining Which Values Are True in an Inequality Equations only have one solution. Inequalities have more than one solution in the solution set. Step 1 Replace each variable in the inequality with one integer from the solution set. Step 2 Simplify the expressions on both sides of the inequality.	

Step 3

Determine whether the ending inequality is true or false.

- If it is true, the number is a solution for the inequality.
- If it is false, the number is not a solution for the inequality.

Step 4

Repeat for all values in the solution set.