

Unit 2- Equations and Inequalities Study Guide



For an interactive lesson on solving equations with variables on both sides, scan me. The "presentation" walks you through the steps and you can practice by clicking on practice.



For an interactive "quiz" on solving inequalities, scan me!



Interactive on solving inequalities and recognizing the graph of an inequality

Information for inequalities

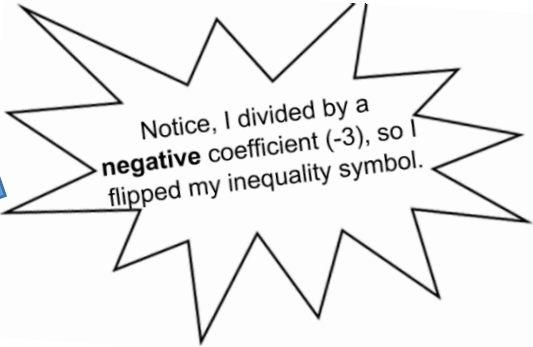
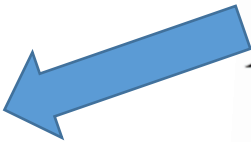
$x > 6$	$x \geq 6$	$x < 6$	$x \leq 6$
<ul style="list-style-type: none"> • A number is more than 6 • A number exceeds 6 • A number is greater than 6 • A number is over 6 	<ul style="list-style-type: none"> • A number is at least 6 • A number has a minimum value of 6 • A number is not less than 6 • A number is not under 6 	<ul style="list-style-type: none"> • A number is less than 6 • A number is under 6 	<ul style="list-style-type: none"> • A number is at most 6 • A number has a maximum value of 6 • A number does not exceed 6 • A number is not more than 6

Inequality Symbol	Type of Circle	Meaning
\leq	CLOSED	The solution is included & it's less than or equal to
\geq	CLOSED	The solution is included & it's greater than or equal to
$<$	OPEN	The solution is not included & it's less than
$>$	OPEN	The solution is not included & it's greater than
\neq	OPEN	Not equal to

****Remember:** When multiplying or dividing by a negative (look for the coefficient with the variable you are isolating to be negative) you flip the inequality symbol!

Problem: $-3x \geq 6$

Solution: $-\frac{3x}{-3} \geq \frac{6}{-3}$
 $x \leq -2$

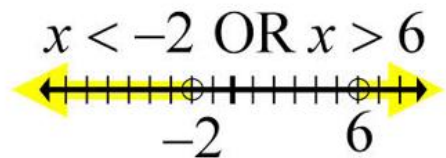


EXAMPLE OF AN "AND" INEQUALITY



Ways to represent the solution set from the left inequality:
 $\{x \mid -5 \leq x \leq 5\}$

EXAMPLE OF AN "OR" INEQUALITY



Ways to represent the solution set from the left inequality:
 $\{x \mid -2 < x \text{ or } x > 5\}$

$-2 < x \text{ or } x > 5$

Undefined Fractions

A fraction is undefined when the denominator is equal to zero.


To determine what makes a fraction undefined you follow these steps.

1. Cross out the numerator	$\frac{\cancel{2x+3}}{4x+12}$
2. Set the denominator equal to zero	$4x + 12 = 0$
3. Solve for the variable	$\begin{array}{r} 4x + 12 = 0 \\ - 12 \quad -12 \\ \hline 4x = -12 \\ 4 \quad 4 \\ \hline x = -3 \end{array}$

There are multiple ways to describe the solution set of the above example:

$\frac{2x+3}{4x+12} ; x \neq -3$ or you can write $\frac{2x+3}{4x+12}$ and $x \neq -3$

Literal Equations: An equation with several variables. The goal is to solve the equation for one variable. Be sure to use inverse operations to obtain your final answer.

<p>Shoe sizes and foot length are related by the formula</p> $S = 3F - 24,$ <p>where S represents the shoe size and F represents the length of the foot, in inches.</p> <p>Solve the formula for F.</p>	
Solution:	Steps:
$S = 3F - 24$	add 24 to both sides
$S + 24 = 3F$	divide both sides by 3
$\frac{S + 24}{3} = \frac{3F}{3}$	simplify
$\frac{S + 24}{3} = F$	Done. 

Commonly Asked variation of a Question on the Regents:

The formula for the volume of a cone is $V = \frac{1}{3}\pi r^2 h$. The radius, r , of the cone may be expressed as

** we want to isolate the variable, r **

$$(3)V = \frac{1}{3}\pi r^2 h$$

$$\frac{3V}{\pi h} = \frac{\pi r^2 h}{\pi h}$$

$$\sqrt{\frac{3V}{\pi h}} = \sqrt{r^2}$$

$$\sqrt{\frac{3V}{\pi h}} = r$$