

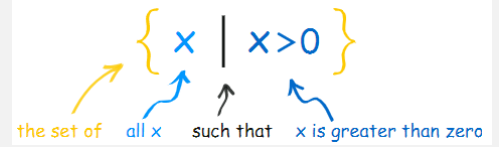
## Topic: Inequalities

Topic/Skill	Definition/Tips	Example
1. Inequality	An inequality says that two values are <b>not equal</b> .  $a \neq b$ means that a is not equal to b.	$7 \neq 3$  $x \neq 0$
2. Inequality symbols	$x > 2$ means <b>x is greater than 2</b> $x < 3$ means <b>x is less than 3</b> $x \geq 1$ means <b>x is greater than or equal to 1</b> $x \leq 6$ means <b>x is less than or equal to 6</b>	State the integers that satisfy $-2 < x \leq 4$ .  -1, 0, 1, 2, 3, 4
3. Inequalities on a Number Line	Inequalities can be shown on a number line.  <b>Open circles</b> are used for numbers that are <b>less than or greater than</b> ( $<$ or $>$ )  <b>Closed circles</b> are used for numbers that are <b>less than or equal or greater than or equal</b> ( $\leq$ or $\geq$ )	
4. Graphical Inequalities	Inequalities can be represented on a coordinate grid.  If the inequality is <b>strict</b> ( $x > 2$ ) then use a <b>dotted line</b> . If the inequality is <b>not strict</b> ( $x \leq 6$ ) then use a <b>solid line</b> .  <b>Shade the region</b> which satisfies all the inequalities.	Shade the region that satisfies: $y > 2x, x > 1$ and $y \leq 3$  
5. Quadratic Inequalities	<b>Sketch the quadratic graph</b> of the inequality.  If the expression is $>$ or $\geq$ then the answer will be <b>above the x-axis</b> . If the expression is $<$ or $\leq$ then the answer will be <b>below the x-axis</b> .  Look carefully at the inequality symbol in the question.  Look carefully if the quadratic is a <b>positive or negative parabola</b> .	Solve the inequality $x^2 - x - 12 < 0$  Sketch the quadratic:  The required region is below the x-axis, so the final answer is: $-3 < x < 4$  If the question had been $> 0$ , the answer would have been: $x < -3$ or $x > 4$
6. Set Notation	A <b>set</b> is a <b>collection of things</b> , usually numbers, denoted with brackets { }	{3, 6, 9} is a set.

$\{x \mid x \geq 7\}$  means 'the set of all x's, such that x is greater than or equal to 7'

The 'x' can be replaced by any letter.

Some people use ':' instead of '|'



$$\{x : -2 \leq x < 5\}$$