Linear inequalities

Solving linear inequalities

Solving linear **inequalities** is similar to solving linear **equations** except we need to be careful with the direction of the inequality sign. Our solution will be a set of values of x.

Example:
$$1 - 2x \le 7$$

 $-2x \le 6$
 $\frac{-2x}{-2} \ge \frac{6}{-2}$

Note: If there is division or multiplication by a negative number you must flip the inequality sign.

This can be written in interval notation as $[-3, \infty)$.

Inequality notation	In words	Interval notation	Line graph
x < a	x is less than a	(−∞, a)	$x \rightarrow x$
$x \le a$	x is less than or equal to a	(−∞, <i>a</i>]	x
x > a	x is greater than a	(a,∞)	$\frac{1}{a}$ x
$x \ge a$	x is greater than or equal to a	[<i>a</i> ,∞)	$\frac{1}{a}$ x
a < x < b	x is between a and b (exclusive)	(a, b)	$a \rightarrow x$
$a \le x \le b$	x is between a and b (inclusive)	[a, b]	a b x
$a < x \le b$	\boldsymbol{x} is greater than \boldsymbol{a} and less than or equal to \boldsymbol{b}	(a, b]	a b x
$a \le x < b$	\boldsymbol{x} is greater than or equal to \boldsymbol{a} and less than \boldsymbol{b}	[<i>a</i> , <i>b</i>)	$a \rightarrow x$
Compound Inequalities	AND, the intersection of sets, i.e. contains only elements common to both sets, the overlap	n	$x > -3$ and $x \le 0$ $\begin{array}{c} -3 & 0 \\ \text{Solution: } (-3, 0] \end{array}$
	OR, the union of sets i.e. contains all the elements from both sets	U	$x > -3 \text{ or } x \le 0$ $-3 \text{ or } x \le 0$ Solution: $(-\infty, \infty)$

For more information or to book an appointment

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