
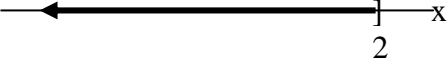


1. A portion of the real number system is represented in each problem below by a graph, inequality, or interval notation. Re-express each interval in the two alternative forms.

	Graph	Inequality	Interval Notation
(a)		$-3 \leq x \leq 1$	
(b)			
(c)			$(-8, 2]$
(d)		$x > -4$	
(e)			

2. Solving linear inequalities algebraically

Solve as if you were solving a linear equation, but remember that you must switch the direction of the inequality *only* if you multiply or divide by a negative number.

Solve. Show your answer graphically on a number line and also express your answer using interval notation.

(a) $-2(x+3) < 8$

(b) $4 < 3x+1 < 10$

3. Absolute value inequalities

$|x| < a$, where a is a positive number, means the set of points whose x -coordinate is less than a units from zero. It is equivalent to the combined inequality $-a < x < a$. In general,

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If a is any positive number and u is any algebraic expression, then
 $|u| < a$ is equivalent to the combined inequality $-a < u < a$ and.
 $|u| \leq a$ is equivalent to the combined inequality $-a \leq u \leq a$

Use this to rewrite each absolute value inequality as a combined inequality without using the absolute value symbol. Then solve for x , show your answer graphically on a number line and also express the answer using interval notation.

(a) $|x| < 5$

(b) $|2x - 3| \leq 7$

$|x| > a$, where a is a positive number, means the set of points whose x -coordinate is more than a units from zero. It is equivalent to the two inequalities $x < -a$ or $x > a$. It **cannot** be rewritten as a combined inequality. In general,

If a is any positive number and u is any algebraic expression, then
 $|u| > a$ is equivalent to $u < -a$ or $u > a$
 $|u| \geq a$ is equivalent to $u \leq -a$ or $u \geq a$

Use this to rewrite each absolute value inequality without using the absolute value symbol. Then solve for x , show your answer graphically on a number line and also express the answer using interval notation.

(c) $|x| \geq 7$

(d) $|5x - 3| > 2$

4.

(a) On a number line, shade all numbers whose distance from zero is more than 1 and then write an inequality using the absolute value symbol to represent all numbers whose distance from zero is more than 1.

(b) On a number line, shade all numbers whose distance from zero is less than 2 and then write an inequality using the absolute value symbol to represent all numbers whose distance from zero is less than 2.