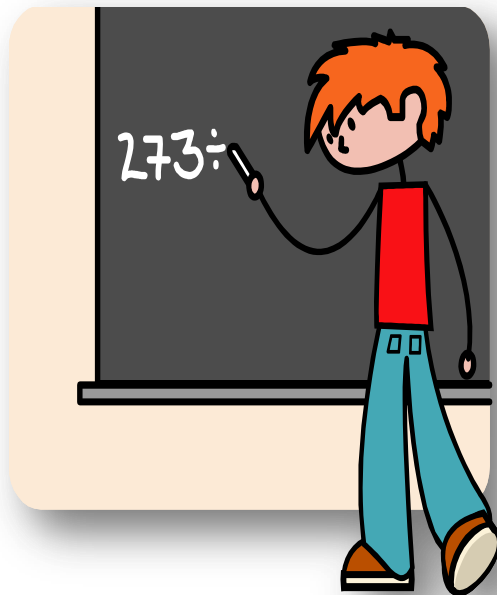


2.5 Linear Inequalities in One Variable

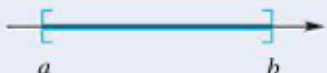
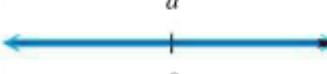
By: Cindy Alder



Objectives:

- Solve linear inequalities by using the addition property.
- Solve linear inequalities by using the multiplication property.
- Solve linear inequalities with three parts.
- Solve applied problems by using linear inequalities.

- Inequalities -

Type of Interval	Set-Builder Notation	Interval Notation	Graph
Open interval	$\{x a < x < b\}$	(a, b)	
Closed interval	$\{x a \leq x \leq b\}$	$[a, b]$	
Half-open (or half-closed) interval	$\{x a \leq x < b\}$	$[a, b)$	
	$\{x a < x \leq b\}$	$(a, b]$	
Disjoint interval*	$\{x x < a \text{ or } x > b\}$	$(-\infty, a) \cup (b, \infty)$	
Infinite interval	$\{x x > a\}$	(a, ∞)	
	$\{x x \geq a\}$	$[a, \infty)$	
	$\{x x < a\}$	$(-\infty, a)$	
	$\{x x \leq a\}$	$(-\infty, a]$	
	$\{x x \text{ is a real number}\}$	$(-\infty, \infty)$	

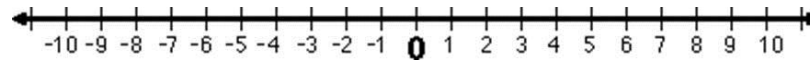
Interval Notation

- Inequalities with:
 - $<$ or $>$
 - $\leq$ or $\geq$
- If $-\infty$ or ∞ is part of the interval,

Example 1

- Solve the inequality and graph the solution set.

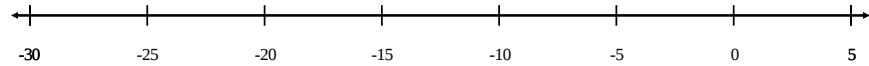
$$5x + 3 \geq 4x - 1$$



Example 2

- Solve each inequality and graph the solution set.

- $4m \geq -100$



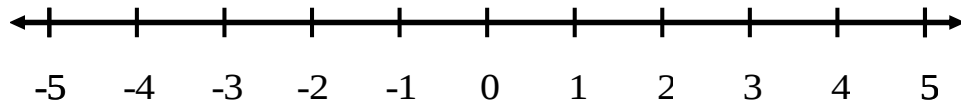
- $-9x > -81$



Example 3

- Solve the inequality and graph the solution set.

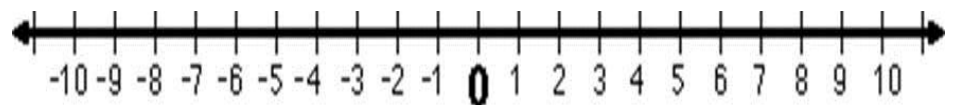
$$6(x - 1) + 3x \geq -x - 3(x + 2)$$



Example 4

- Solve the inequality and graph the solution set.

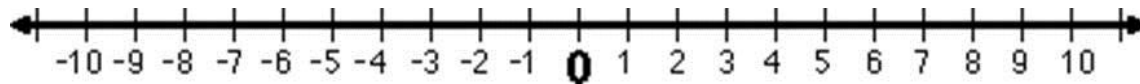
$$\frac{1}{4}(x + 3) + 2 \leq \frac{3}{4}(x + 8)$$

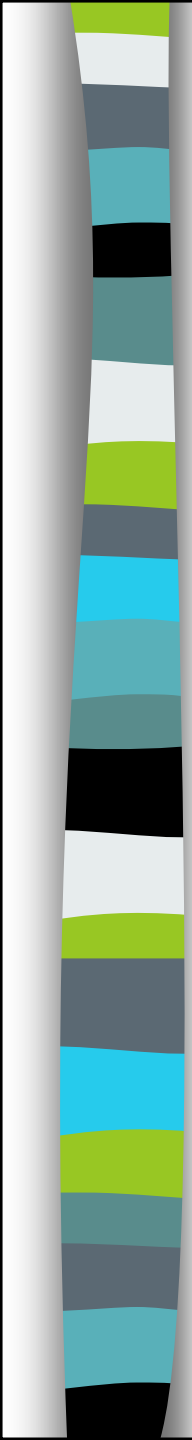


Example 5

- Solve the inequality and graph the solution set.

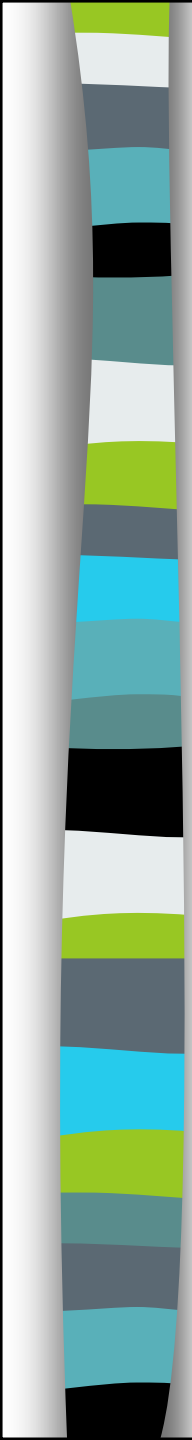
$$-4 < x - 2 \leq 5$$





Example 6

- A rental company charges \$5 to rent a leaf blower, plus \$1.75 per hour. Marge Ruhberg can spend no more than \$26 to blow leaves from her driveway and pool deck. What is the *maximum* amount of time she can use the leaf blower?



Example 7

- Abby has scores of 92, 90, and 84 on her first three tests. What score must she make on her fourth test in order to keep an average of *at least* 90?