

Chapter P.9: Linear Inequalities

$$ax + b \leq c$$

Remember when to flip the sign...

$$x < \bigcirc \quad)$$

$$x > \bigcirc \quad ($$

$$x \leq \bullet \quad]$$

$$x \geq \bullet \quad [$$

NOW

Graph:

$x < 3$

$x \geq -1$

$-1 < x \leq 3$



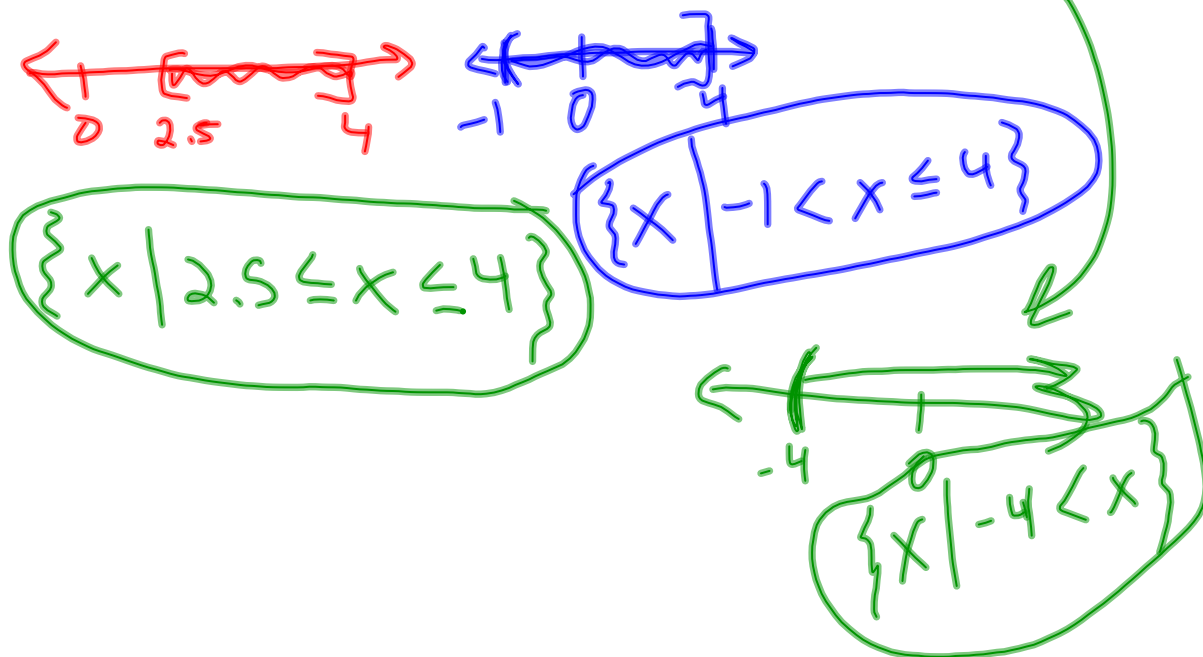
Interval Notation	Set Notation	Graph
(a,b)	$\{x a < x < b\}$	
$[a,b]$	$\{x a \leq x \leq b\}$	
$(a,b]$	$\{x a < x \leq b\}$	
$[a,b)$	$\{x a \leq x < b\}$	
(a,∞)	$\{x x > a\}$	
$[a,\infty)$	$\{x x \geq a\}$	
$(-\infty,b)$	$\{x x < b\}$	
$(-\infty,b]$	$\{x x \leq b\}$	
$(-\infty,\infty)$	$\{x x \in \mathbb{R}\}$	

Express in Set Notation and graph.

$[2.5, 4]$

$(-1, 4]$

$(-4, \infty)$



Solve and graph: $7x + 15 \geq 13x + 51$

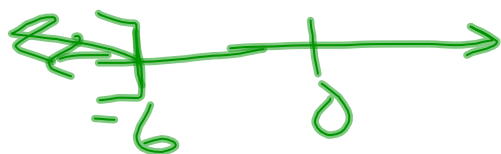
$$-7x \quad -7x$$

$$15 \geq 6x + 51$$

$$-51 \quad -51$$

$$\frac{-36}{6} \geq \frac{6x}{6}$$

$$-6 \geq x$$



Solve and Graph: $-3 < 2x + 1 \leq 3$

$-1 \quad -1 \quad -1$

$$\frac{-4 < 2x \leq 2}{2}$$



$$-2 < x \leq 1$$

Absolute Value Inequalities:

$$|x| < c \quad x < c, -x < c$$

$$-c < x < c$$

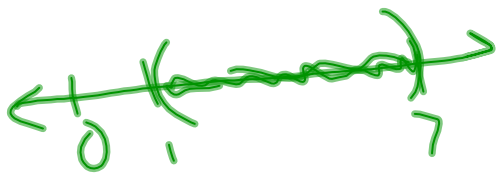
Solve and graph:

$$|x - 4| < 3$$

$$x - 4 < 3 \quad -x + 4 < 3$$

$$x < 7 \quad -x < -1$$

$$x > 1$$



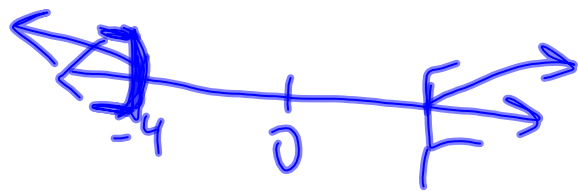
$$|2x + 3| \geq 5$$

$$2x + 3 \geq 5 \quad -2x - 3 \geq 5$$

$$-3 \quad -3 \quad -2x \geq 8$$

$$2x \geq 2 \quad x \leq -4$$

$$x \geq 1$$



A long-distance phone plan has a monthly fee of \$15 with a \$.08 charge per minute. If x is the number of minutes, what are the limitations if you want to spend at most \$35 per month.

$$.08x + 15 \leq 35$$

Suggested Homework:
Chapter P.9 pg.106 #'s
9,19,29,35,43,51,59,65,
79,103