

## 3.4 Inequalities

$<$	$\leq$	$>$	$\geq$
less than	less than or equal to	greater than	greater than or equal to

\* flip the sign when you multiply or divide both sides by a negative.

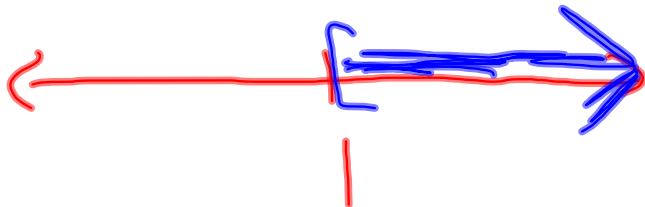
$$\text{Ex: } 2x + \cancel{3} \geq 5$$

$$\hline \frac{2x}{2} \geq \frac{2}{2}$$

$$x \geq 1$$

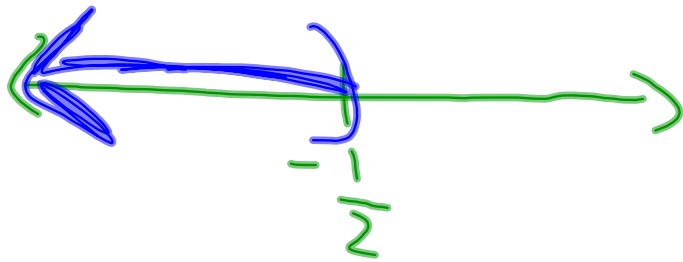
$$<, > = ( )$$

$$\leq, \geq = [ ]$$



$$\frac{-4x}{-4} > \frac{2}{-4}$$

$$x < -\frac{1}{2}$$

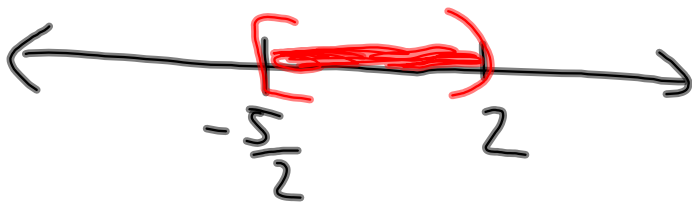


Ex:

$$\frac{-2 \leq 2x + 3 < 7}{-3 \quad -3}$$

$$-\frac{5}{2} \leq 2x < 4$$

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



$$x \leq -4 \quad \underline{\text{or}} \quad x > 2$$

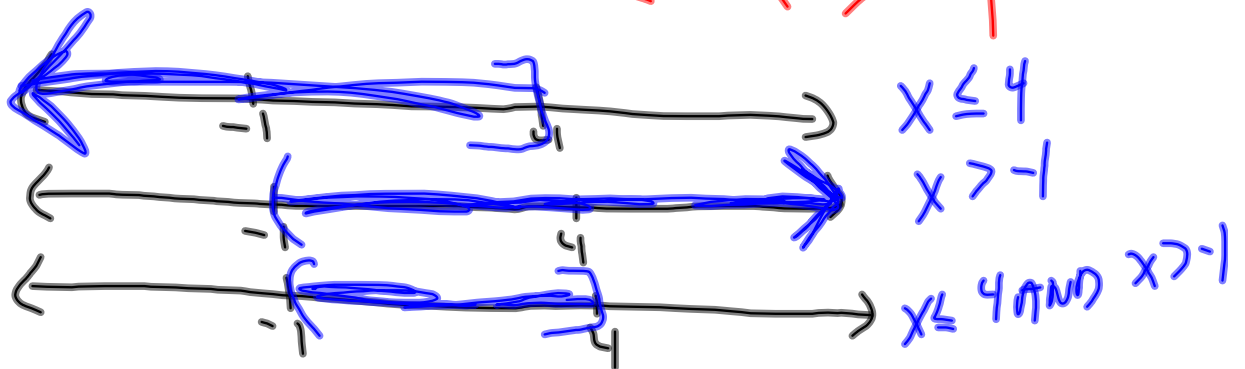


$$2x - 4 \leq 4 \quad \underline{\text{and}} \quad 2x + 8 > 6$$

$$\frac{2x}{2} \leq \frac{8}{2}$$

$$\frac{2x}{2} > \frac{-2}{2}$$

$$x \leq 4 \quad \underline{\text{AND}} \quad x > -1$$



HW: 210  
P: 2-70 even

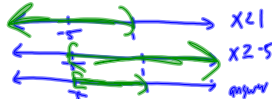
54.  $24 \left( \frac{1}{2} + \frac{3}{4} \right) \geq 24$

$4(x+3) + 3x \geq 24$   
 $4x + 12 + 3x \geq 24$

$7x + 12 \geq 24$   
 $-12 \quad -12$   
 $7x \geq 12$

$x \geq \frac{12}{7}$   
 $\left[ \frac{12}{7}, \infty \right)$

64.  $x - 3x > 5$  and  $x - 5 \geq -10$   
 $\frac{-3x}{-3} > \frac{-3}{-3}$  and  $\frac{x - 5}{1} \geq \frac{-10}{1}$   
 $x < 1$  and  $x \geq -5$



50.  $4 \left[ \frac{z-2}{3} \right] < 2 - 7z$

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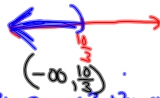
$4 \left[ \frac{z-2}{3} \right] < 2 - 7z$

$-4z - 8 < 2 - 7z$   
 $+7z \quad +7z$

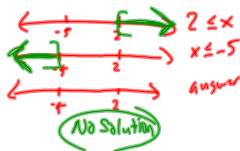
$3z - 8 < 2$   
 $+8 \quad +8$

$\frac{3z}{3} < \frac{10}{3}$

$z < \frac{10}{3}$



66.  $9x \leq 5 + 2x$  and  $3x - 7 \leq -22$   
 $\frac{9x}{-3} \leq \frac{5+2x}{-3}$  and  $\frac{3x-7}{3} \leq \frac{-22}{3}$   
 $\frac{6x}{3} \leq \frac{3x}{3}$  and  $x \leq -5$



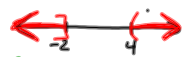
62.  $-1 < \frac{x}{6} < 1$

$6 > x > -6$



Interval notation:

$(-6, 6)$



$(-\infty, -2] \cup (4, \infty)$

Hw p. 210

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