

1. The target heart rate during exercise for a 15-year-old is between 154 and 174 beats per minute inclusive. Write a compound inequality to show the heart rates that are within the target range. Graph the solutions.

$154 \leq x \leq 174$

Solve each compound inequality and graph the solutions.

2.  $2 \leq 2w + 4 \leq 12$

$2 \leq 2w + 4$  and  $2w + 4 \leq 12$

$\frac{2}{-4} \leq \frac{2w+4}{-4}$  and  $\frac{2w+4}{-4} \leq \frac{12}{-4}$

$\frac{-2}{2} \leq \frac{2w}{2}$  and  $\frac{2w}{2} \leq \frac{8}{2}$

$-1 \leq w$  and  $w \leq 4$

$-1 \leq w \leq 4$

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3.  $3 + r > -2$  OR  $3 + r < -7$

$r > -5$  or  $r < -10$

Write the compound inequality shown by each graph.

4.  $x \geq 0$  or  $x < -7$

5.  $-2 \leq x < 4$

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Write the compound inequality shown by each graph.

1.  $-2 < x < 4$

2.  $-3 < x$  or  $x \geq 3$

3.  $x > -2$  and  $x < 4$

4.  $-15 \geq x$  or  $x \geq -8$

$0 \leq x < 20$

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5.  $-15 < x - 8 < -4$

$-15 < x - 8$  and  $x - 8 < -4$

$-15 + 8 < x - 8 + 8$  and  $x - 8 + 8 < -4 + 8$

$-7 < x$  and  $x < 4$

$-7 < x < 4$

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6.  $12 \leq 4n < 28$

$\frac{12}{4} \leq \frac{4n}{4}$  and  $\frac{4n}{4} < \frac{28}{4}$

$3 \leq n$  and  $n < 7$

$3 \leq n < 7$

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7.  $-2 \leq 3b + 7 \leq 13$

$-2 \leq 3b + 7$  and  $3b + 7 \leq 13$

$\frac{-2}{3} \leq \frac{3b+7}{3}$  and  $\frac{3b+7}{3} \leq \frac{13}{3}$

$-\frac{2}{3} \leq b + \frac{7}{3}$  and  $b + \frac{7}{3} \leq \frac{13}{3}$

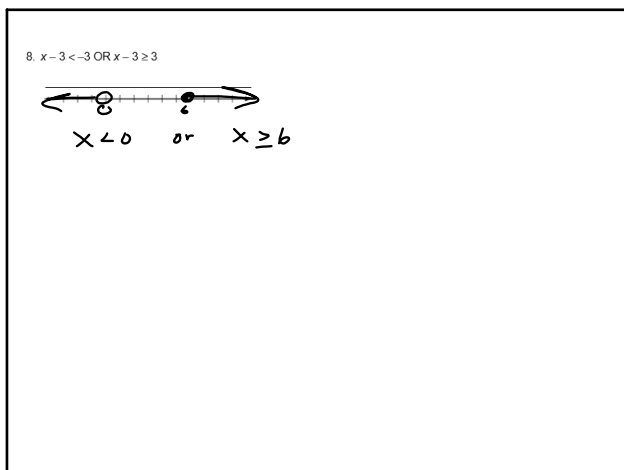
$-\frac{2}{3} - \frac{7}{3} \leq b + \frac{7}{3} - \frac{7}{3}$  and  $b + \frac{7}{3} - \frac{7}{3} \leq \frac{13}{3} - \frac{7}{3}$

$-\frac{9}{3} \leq b$  and  $b \leq \frac{6}{3}$

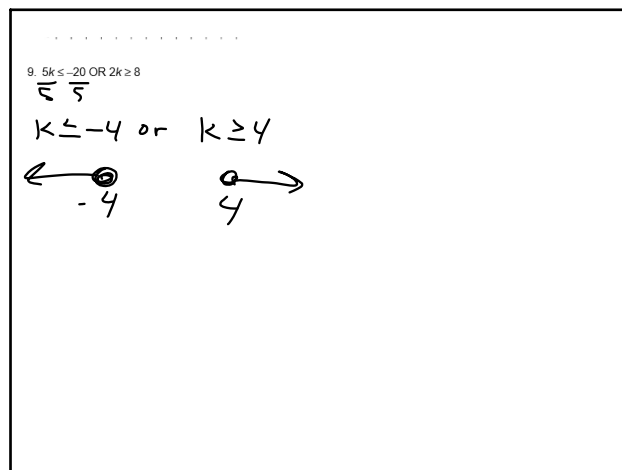
$-3 \leq b$  and  $b \leq 2$

$-3 \leq b \leq 2$

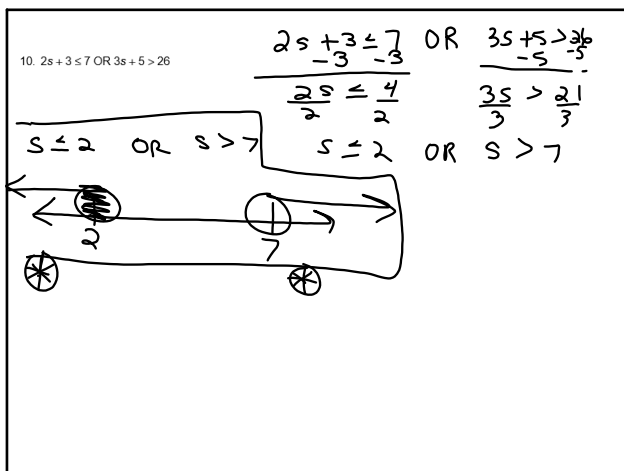
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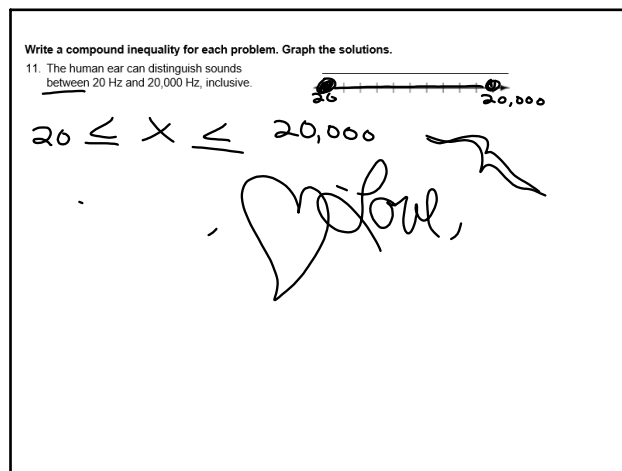
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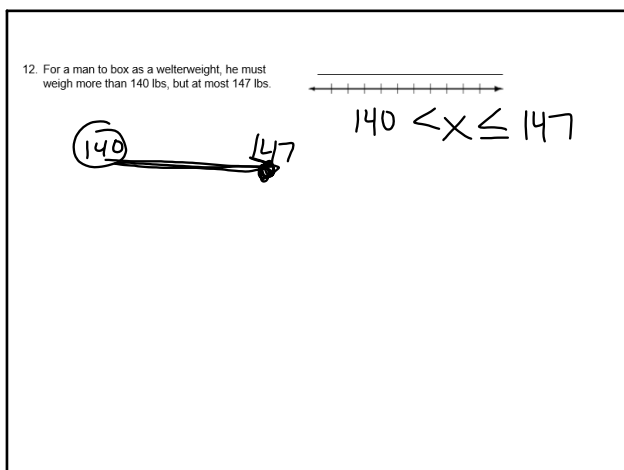
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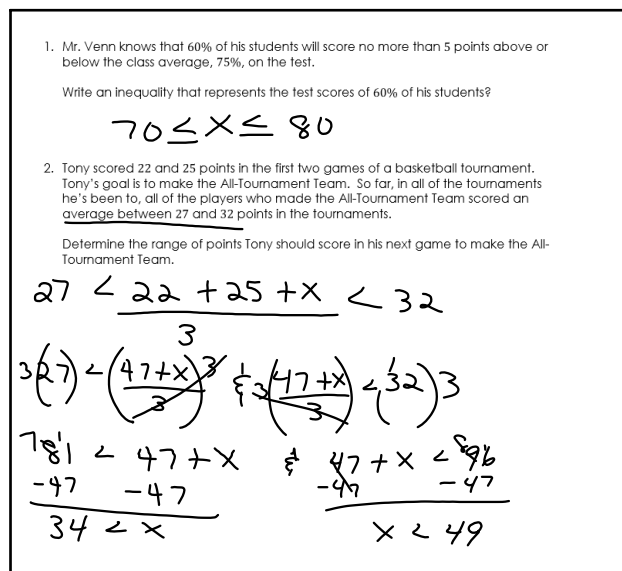
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$$90 \leq \frac{85 + 100 + x}{3} \leq 100$$

$$90 \leq \frac{185 + x}{3} \leq 100$$

$$3(90) \leq \frac{(185 + x)3}{3} + \frac{185 + x}{3} \leq 100$$

$$270 \leq 185 + x$$

$$\begin{array}{r} 270 \\ 185 \\ \hline 85 \end{array}$$

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3. Consider the bank of terms and symbols depicted below.

$-9x$	$-4$	$20$	$-$	$2$	$5$	$>$
$7x$	$<$	$2$	or	$4x$	$+$	$>$

Use the terms and symbols in the bank to write a compound inequality for the graph below. You may only use each term once, but you do not have to use all the terms.

$x < -2$  or  $x > 5$

$$\begin{array}{r} -9x + 7x > 2 + 2 \\ -2x > 4 \\ \frac{-2x}{-2} > \frac{4}{-2} \\ x < -2 \end{array}$$

$$\begin{array}{r} 4x > 20 \\ \frac{4x}{4} > \frac{20}{4} \\ x > 5 \end{array}$$

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Absolute values measure distance

Distance is always positive!

$|x|$  what ever is inside the bars you simplify and then make positive.

$$|-5| = 5 \quad \left| \frac{10-20}{-10} \right| = 10$$

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Steps To Solving

- 1) Isolate  $|x|$   
1 - Add/subtract  
2 - mult./div
- 2) Remove Bars
- 3) Set what was inside Bars equal to positive & negative
- 4) Solve
- 5) Check your ANSWERS

Example

$$3|x-4|+2=20$$

$$3|x-4|=18$$

$$\frac{3}{3} \frac{|x-4|}{3} = \frac{18}{3}$$

$$|x-4|=6$$

$$x-4=6 \quad \& \quad x-4=-6$$

$$\begin{array}{r} x-4=6 \\ +4 \quad +4 \\ \hline x=10 \end{array} \quad \begin{array}{r} x-4=-6 \\ +4 \quad +4 \\ \hline x=-2 \end{array}$$

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Solve each equation.

4.  $|x|=8$   
 $x=8 \quad x=-8$
5.  $|x|=14$   
 $x=14, -14$
6.  $|x|-6=3 \quad |x|=9$   
 $x=9 \text{ or } -9$
7.  $|x-7|=10$   
 $x=17, -7$
8.  $|x+2|=9$   
 $x=7, -11$
9.  $|x-5|=6$   
 $x=11, -1$
10.  $3|x|=15$   
 $x=5, x=-5$
11.  $4|x+2|=20$   
 $|x+2|=5$   
 $x+2=5 \quad x+2=-5$   
 $\frac{x+2}{-2} = \frac{5}{-2} \quad \frac{x+2}{-2} = \frac{-5}{-2}$   
 $x=-3 \quad x=-7$
12.  $|x+1|-2=8$   
 $|x+1|=10$   
 $x+1=10 \quad x+1=-10$   
 $x=9 \quad x=-11$

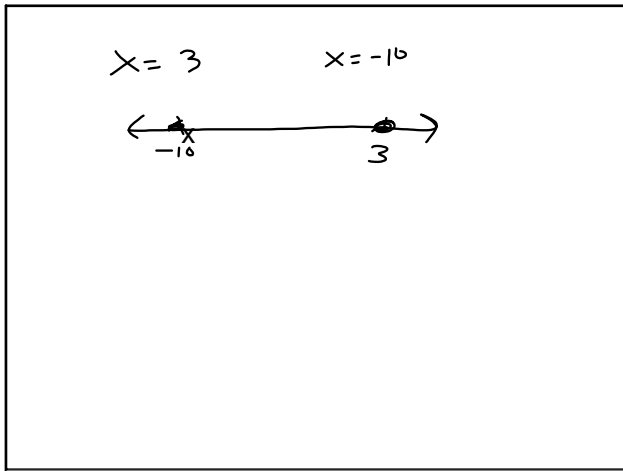
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$$\frac{|x|-3}{+3} = \frac{-10}{+3}$$

$$|x| = -7$$

No Solution

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