Algebra 1A

Lesson 6.4

Solve Compound Inequalities

Warm-Up

Solve and graph each of the following inequalities.

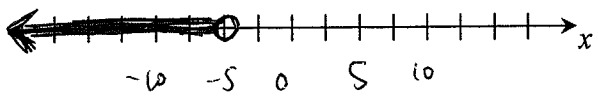
(a) $3(x+8)<9$

$3x+24<9$

$-24 \quad -24$

$\frac{3x}{3} < \frac{-15}{3}$

$x<-5$

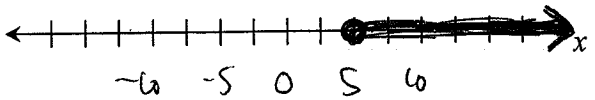


(b) $-2x+4 \le -6$

$-4 \quad -4$

$\frac{-2x}{-2} \le \frac{-10}{-2}$

$x \ge 5$



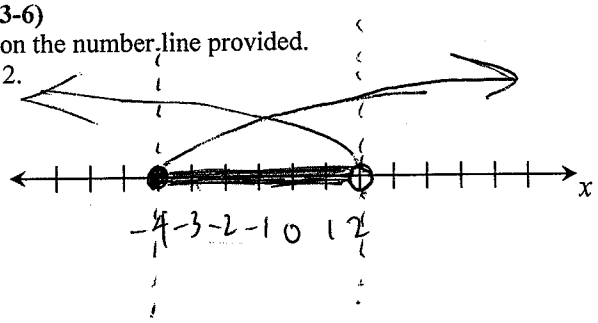
Example 1. Write and Graph Compound Inequalities (Assignment #3-6)

Translate the verbal phrase into an inequality. Then graph the inequality on the number line provided.

(a) All the real numbers that are greater than or equal to -4 **and** less than 2.

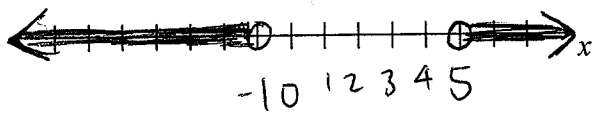
$x \ge -4$ and $x < 2$

$-4 \le x < 2$



(b) All the real numbers that are less than -1 **or** greater than 5.

$x < -1$ OR $x > 5$

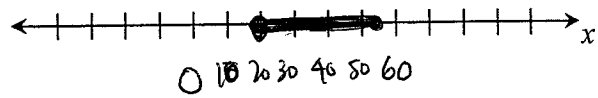


Example 2. Write and Graph a Real-World Compound Inequality (Assignment #7, 8)

An autographed basketball for sale on ebay started with an opening bid of $20. When it was sold the winning bid was $54. Write and graph a compound inequality that describes all of the possible bids.

$x \ge 20$ and $x \le 54$

$20 \le x \le 54$



Example 3. Solve a Compound Inequality with "and" (Assignment #9-20)

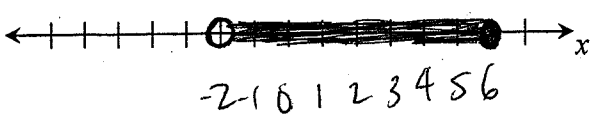
Solve and graph each inequality.

(a) $-1 < x+1 \le 7$

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

$-2 < x \le 6$

$x+1 > -1$ and $x+1 \le 7$



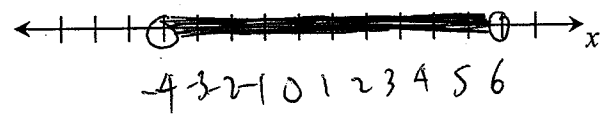
(b) $-7 < -z+1 < 3$

$+1 \quad +1 \quad +1$

$\frac{-6}{-1} < \frac{-z}{-1} < \frac{4}{-1}$

$6 > z > -4$

$-4 < z < 6$



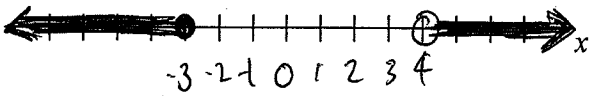
Example 4. Solve a Compound Inequality with "or" (Assignment #9-20)
Solve and graph each inequality.

(a) $3x-2\le -11 \text{ or } 2x+8>16$

$+2\ +2 \quad -8\ -8$

$\frac{3x}{3}\le\frac{-9}{3}$ OR $\frac{2x}{2}>\frac{8}{2}$

$x\le -3$ OR $x>4$

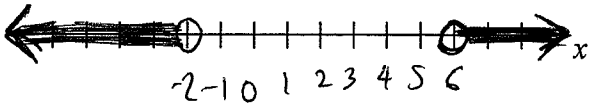


(b) $3x+1<-5 \text{ or } 2x-5>7$

$-1\ -1 \quad +5\ +5$

$\frac{3x}{3}<\frac{-6}{3}$ OR $\frac{2x}{2}>\frac{12}{2}$

$x<-2$ OR $x>6$



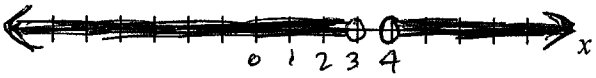
Try It!
Solve and graph each inequality. Be sure to look to see if it is "and" or "or".

(a) $2x+8<14 \text{ or } 2x-5>3$

$-8\ -8 \quad +5\ +5$

$\frac{2x}{2}<\frac{6}{2}$ OR $\frac{2x}{2}>\frac{8}{2}$

$x<3$ OR $x>4$

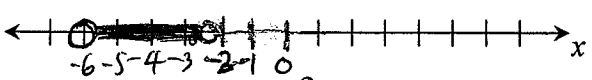


(b) $22>-3x+4>11$

$-4 \quad -4 \quad -4$

$\frac{18}{-3}>\frac{-3x}{-3}>\frac{7}{-3}$

$-6<x<-2.3$

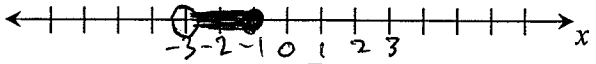


(c) $3x+2>-7 \text{ and } 4x-1\le -5$

$-2\ -2 \quad +1\ +1$

$\frac{3x}{3}>\frac{-9}{3}$ and $\frac{4x}{4}\le\frac{-4}{4}$

$x>-3$ and $x\le -1$

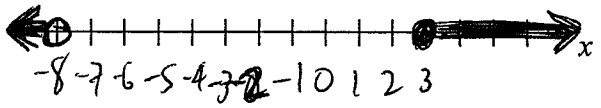


$-3<x\le -1$

(d) $x-4\ge -1 \text{ or } \frac{-3x}{-3}>\frac{24}{-3}$

$+4\ +4$

$x\ge 3$ OR $x<-8$



Assignment
New: Pg. 384 #4-26 (evens), 38

Review:
Use the following information to write the equation of the line in point-slope form, slope intercept form and then standard form.

1. (2,6) m = 2

PS _____

SI _____

SF _____

2. (3,-8) (5,6)

PS _____

SI _____

SF _____

3. (6, -2) m = ½

PS _____

SI _____

SF _____