Algebra 1A

Lesson 6.6

Solve Absolute Value Inequalities

Warm-Up

Solve each of the following equations or inequalities. For each inequality, use the given number line to graph.

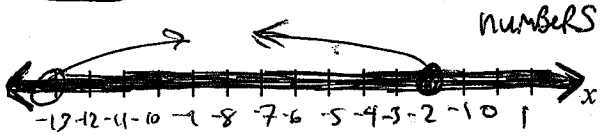
(a) $2x+1 \le -3$ *or* $x+8 > -5$

$-1 \quad -1 \qquad -8 \quad -8$

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

$x \le -2$ OR $x > -13$

all real numbers



(b) $|x-6| = 4$

$x-6=4$ or $x-6=-4$

$+6 \quad +6 \qquad +6 \quad +6$

$x=10$ or $x=2$

(c) $|x+5|-8=-2$

$+8 \quad +8$

$|x+5| = 6$

$x+5=6$ or $x+5=-6$

$-5 \quad -5 \qquad -5 \quad -5$

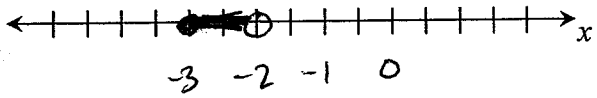
$x=1$ or $x=-11$

(d) $-8 \le 3x+1 < -5$

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

$\frac{-9}{3} \le \frac{3x}{3} < \frac{-6}{3}$

$-3 \le x < -2$

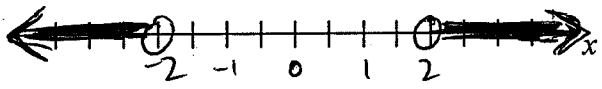


Example 1. Solve and Graph and Absolute Value Inequality

Solve and graph each inequality.

(a) $|x| > 2$

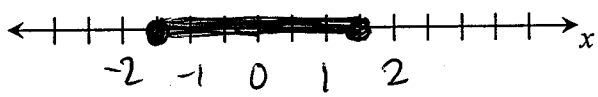
$x < -2$ OR $x > 2$



(b) $|x| \le 1.5$

$x \ge -1.5$ and $x \le 1.5$

$-1.5 \le x \le 1.5$



Example 2. Solve an Absolute Value Inequality (greatOR)

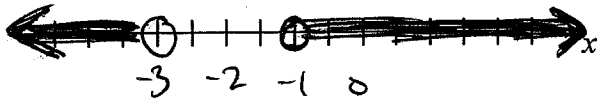
Solve and graph each inequality.

(a) $|x+2| > 1$

$x+2 < -1$ OR $x+2 > 1$

$-2 \quad -2 \qquad -2 \quad -2$

$x < -3$ OR $x > -1$



(b) $|x+3|-5 > 3$

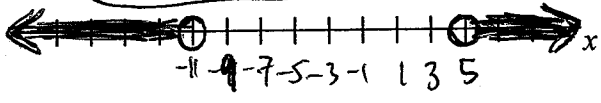
$+5 \quad +5$

$|x+3| > 8$

$x+3 < -8$ OR $x+3 > 8$

$-3 \quad -3 \qquad -3 \quad -3$

$x < -11$ OR $x > 5$



Example 3. Solve an Absolute Value Inequality (less thAND)
Solve and graph each inequality.

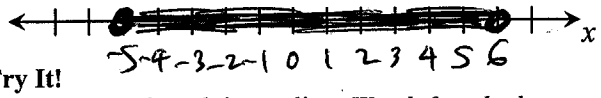
(a) $|2x-1| \le 11$

$-11 \le 2x-1 \le 11$

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

$\frac{-10}{2} \le \frac{2x}{2} \le \frac{12}{2}$

$-5 \le x \le 6$



(b) $|2x+3|-4<5$

$+4 \quad +4$

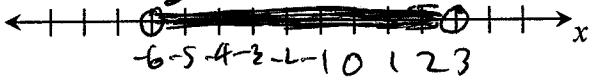
$|2x+3| < 9$

$-9 < 2x+3 < 9$

$-3 \quad -3 \quad -3$

$\frac{-12}{2} < \frac{2x}{2} < \frac{6}{2}$

$-6 < x < 3$



Try It!
Solve and graph each inequality. *Watch for whether you should use **OR** or **AND**!*

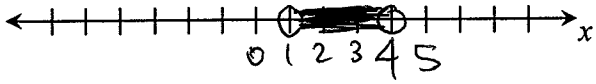
(a) $|2x-5|<3$

$-3 < 2x-5 < 3$

$+5 \quad +5 \quad +5$

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

$1 < x < 4$



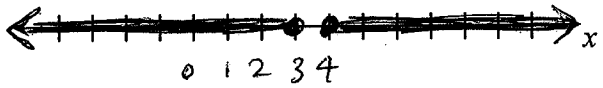
(b) $|2x-7| \ge 1$

$2x-7 \le -1$ or $2x-7 \ge 1$

$+7 \quad +7 \qquad +7 \quad +7$

$\frac{2x}{2} \le \frac{6}{2} \qquad \frac{2x}{2} \ge \frac{8}{2}$

$x \le 3$ or $x \ge 4$



(c) $|x+8|-2 \le 10$

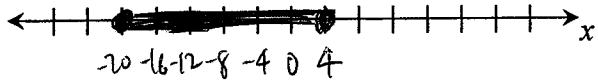
$+2 \quad +2$

$|x+8| \le 12$

$-12 \le x+8 \le 12$

$-8 \quad -8 \quad -8$

$-20 \le x \le 4$



(d) $\frac{3|6-2x|}{3} > \frac{12}{3}$

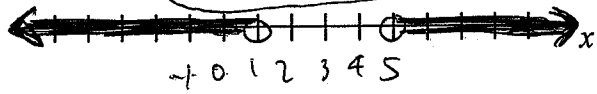
$|6-2x| > 4$

$6-2x < -4$ or $6-2x > 4$

$-6 \quad -6 \qquad -6 \quad -6$

$\frac{-2x}{-2} < \frac{-10}{-2} \qquad \frac{-2x}{-2} > \frac{-2}{-2}$

$x > 5$ or $x < 1$



Assignment
New: Pg. 401 #4-24 (evens)

Review:
Solve only.

1. $-15 \le 5x < 20$

2. $8x-11<5$ or $4x-7>13$

3. $12 > 4-x > -5$

4. $|x+7| = 11$