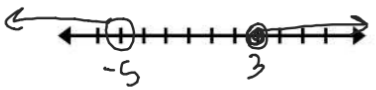
Int2Acc	Notes 2-3 Absolute Value Inequalities	Unit 2

Warm Up: Solve and graph the following equations.

A. $-2x+7>17$ *or* $3x\geq 9$

$-2x>10$ $\quad x\geq 3$

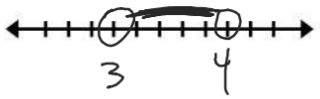
$x<-5$



$x<-5$ or $x\geq 3$

B. $\frac{9}{3}<\frac{3x}{3}<\frac{12}{3}$

$3<x<4$



C. $12\leq -8t-12<-20$

$+12 \quad +12 \quad +12$

$\frac{24}{-8}\leq\frac{-8t}{-8}<\frac{-8}{-8}$

$-3\geq t>1$

N.S.

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Absolute Value: how far the value is from zero!

$x<3$ AND $x>-3$

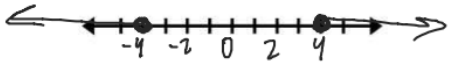
Ex 1:

A. Graph $|x|<3$

2, -1, 2.9, -2.5

B. Graph $|x|\geq 4$

$x\geq 4$ or $x\leq -4$



Ex 2: Write each absolute value inequality as 2 separate inequalities.

A. $|2x|>4$

$2x>4$ $\quad 2x<-4$

B. $|3x-4|\leq 8$

$3x-4\leq 8$ $\quad 3x-4\geq -8$

How to solve absolute value inequalities:

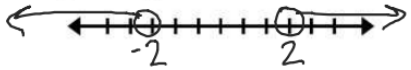
1. Be sure the absolute value is alone
2. Split into 2 inequalities
3. Solve them
4. Graph them
5. Write answer as an AND or OR

Ex 3: Solve and graph each inequality.

A. $|5x| > 10$

$\frac{5x}{5} > \frac{10}{5}$ $\quad$ $\frac{5x}{5} < \frac{-10}{5}$

$x > 2$ $\quad$ $x < -2$



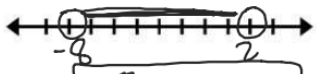
$x < -2$ or $x > 2$

B. $|3x + 9| < 15$

$3x + 9 < 15$ $\quad$ $3x + 9 > -15$

$3x < 6$ $\quad$ $3x > -24$

$x < 2$ $\quad$ $x > -8$



$-8 < x < 2$

C. $\left|\frac{1}{2}x + 8\right| \le 10$

$\frac{1}{2}x + 8 \le 10$ $\quad$ $\frac{1}{2}x + 8 \ge -10$

$\frac{1}{2}x \le 2$ $\quad$ $\frac{1}{2}x \ge -18$

$x \le 4$ $\quad$ $x \ge -36$

$-36 \le x \le 4$

D. $|2x - 5| + 3 \ge 22$

$-3 \quad -3$

$|2x - 5| \ge 19$

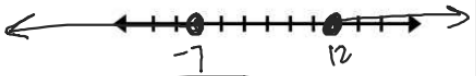
$2x - 5 \ge 19$ $\quad$ $2x - 5 \le -19$

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

$2x \ge 24$ $\quad$ $2x \le -14$

$\frac{2x}{2} \ge \frac{24}{2}$ $\quad$ $\frac{2x}{2} \le \frac{-14}{2}$

$x \ge 12$ $\quad$ $x \le -7$



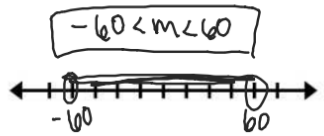
$x \le -7$ OR $x \ge 12$

E. $3\left|\frac{m}{2}\right| < 90$

$\frac{3}{3}$ $\quad$ $\left|\frac{m}{2}\right| < 30$

$\frac{m}{2} < 30$ $\quad$ $\frac{m}{2} > -30$

$m < 60$ $\quad$ $m > -60$



$-60 < m < 60$

F. ~~$2|3x - 1| + 6 < 10$~~

$-3|2x - 1| + 4 < -20$

$-4 \quad -4$

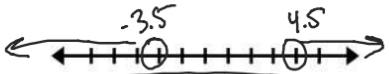
$\frac{-3|2x-1|}{-3} \le \frac{-24}{-3}$

$|2x - 1| > 8$

$2x - 1 > 8$ $\quad$ $2x - 1 < -8$

$2x > 9$ $\quad$ $2x < -7$

$x > 4.5$ $\quad$ $x < -3.5$



$x < -3.5$ or $x > 4.5$

G. $3\left|\frac{k}{4}\right| - 9 \le 15$

$+9 \quad +9$

$\frac{3}{3}$ $\quad$ $\left|\frac{k}{4}\right| \le \frac{24}{3}$

$\left|\frac{k}{4}\right| \le 8$

$\frac{k}{4} \le 8$ $\quad$ $\frac{k}{4} \ge -8$

$k \le 32$ $\quad$ $k \ge -32$

$-32 \le k \le 32$