M2:L2.5

Creating and Solving Compound Inequalities

Objective: We will be able to solve compound inequality and graph the solution set.

Vocabulary

A compound statement is formed by combining two or more simple statements.

- A compound statement can be true or false.
- A compound statement involving **AND** is true when both simple statements are true.
- A compound statement involving **OR** is true when either one simple statement or both are true.

Compound inequality is when one combining two or more simple inequalities forms .

- The graph of a compound inequality involving **AND** is the **intersection**, or the overlapping region, of the simple inequality graphs.

Compound Inequalities: AND		
Words	**Algebra**	**Graph**
All real numbers greater than 2 **AND** less than 6	$x > 2$ **AND** $x < 6$ $2 < x < 6$	

- The graph of a compound inequality involving **OR** is the **union**, or the combined region, of the simple inequality graphs.

Compound Inequalities: OR		
Words	**Algebra**	**Graph**
All real numbers less than or equal to 2 **OR** greater than or equal to 6	$x \leq 2$ **OR** $x \geq 6$	

Domain

1 Example Solve each compound inequality, graph the solutions and interval notation.

A $4 \leq x+2 \leq 8$

switch same

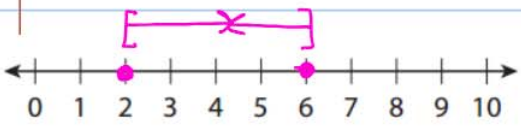
$x+2 \geq 4$ $\quad$ $x+2 \leq 8$

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

$x \geq 2$ $\quad$ $x \leq 6$

$[\quad]$

$D: [2, 6]$



B $-2 \leq x-3 < 5$

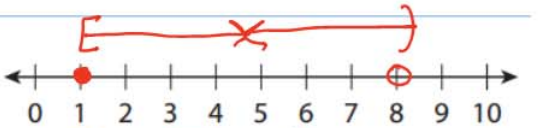
switch same

$x-3 \geq -2$ $\quad$ $x-3 < 5$

$+3 \quad +3$ $\quad$ $+3 \quad +3$

$x \geq 1$ $\quad$ $x < 8$

$[\quad)$



$D: [1, 8)$

2 **Example** Solve each compound inequality, graph the solutions and interval notation.

A $-5 \le 2x+3 < 9$

switch / same

$2x+3 \ge -5$ and $2x+3 < 9$

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

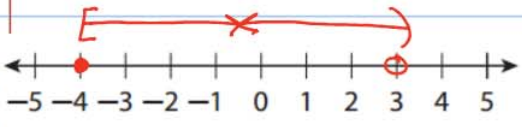
$\frac{2x}{2} \ge \frac{-8}{2}$ $\quad \frac{2x}{2} < \frac{6}{2}$

$x \ge -4$ $\quad x < 3$

[$\quad$)

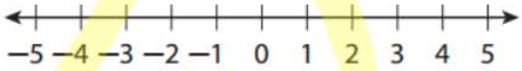
$D: [-4, 3)$

E



B $-10 < 3x+2 \le 8$

Skip



3 **Example** Solve each compound inequality, graph the solutions and interval notation.

A $-4+x>1 \quad or \quad -4+x<-3$

B $x-5 \ge 1 \quad or \quad x-5 \le -6$