Compound Inequalities

- consist of two inequalities connected by the words "and" or "or"
- "and" problems: solution must work for both inequalities
- "or" problems: solution must work for one or the other inequality

Write an inequality and graph the solution.

1. All numbers that are greater than or equal to -2 and less than 3.

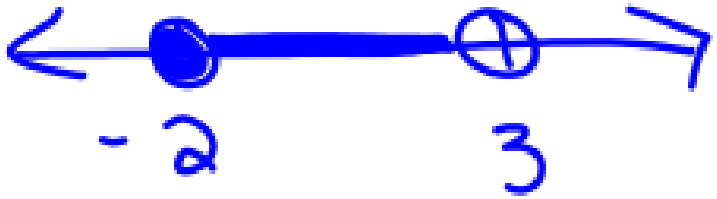
$x \geq$ $\geq$ $<$

$-2 \leq x < 3$

Combine these two

$x \geq -2$

$x < 3$



Write an inequality and graph the solution.

2. All numbers that are less than or equal to -3 or greater than 0.

$x \leq -3 \quad \text{or} \quad x > 0$

Solve and graph.

3. $-5 \leq 2x + 3 < 7$

$-5 \leq 2x+3$

$-3 \quad -3$

$\frac{-8}{2} \leq \frac{2x}{2}$

$-4 \leq x$

$2x+3 < 7$

$-3 \quad -3$

$\frac{2x}{2} < \frac{4}{2}$

$x < 2$

$-4 \leq x < 2$

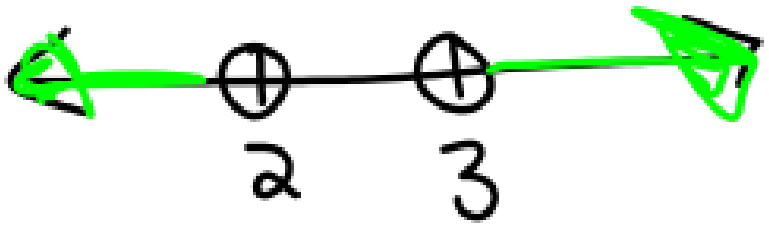
Solve and graph.

4. $6x - 5 < 7$ or $8x + 1 > 25$

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

$6x < 12 \qquad 8x > 24$

$x < 2 \qquad x > 3$



Solve and graph, then state if the x-value is a solution.

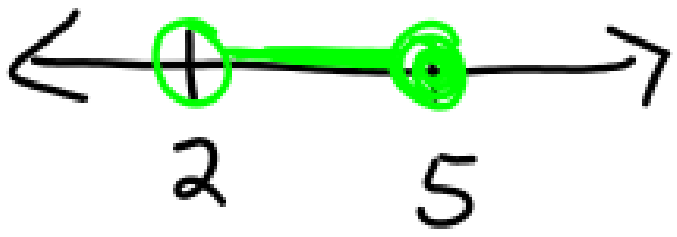
5. $-1 < 7x - 15 \leq 20$; $x = 5$

$-1 < 7x - 15$ and $7x - 15 \leq 20$

$+15 \quad +15$ $\quad +15 \quad +15$

$\frac{14}{7} < \frac{7x}{7}$ $\quad \frac{7x}{7} \leq \frac{35}{7}$

$2 < x$ $\quad x \leq 5$



$x = 5$ is a solution