Absolute Value Inequalities
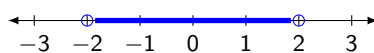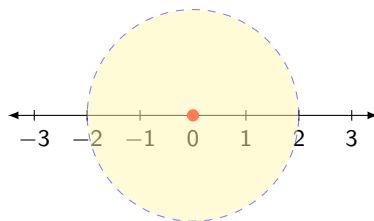
Summary

1. Absolute value inequalities are examples of compound inequalities.

2. Check the answers you get in the original problem.

Absolute value inequalities are similar to absolute value equations.

Less Than ($<$) and Less Than or Equal To ($\leq$)

For $|x| < 2$, we want all values of x that are **less than 2 units from 0** on a number line:

$|x| < 2$ means $-2 < x < 2$

or

$x > -2 \quad \text{AND} \quad x < 2$

Example 1. Solve and graph each.

(a) $|2x - 2| < 5$ 　　　　　　 (b) $|x - 9| \leq 2.9$ 　　　　　　 (c) $|x + 2| \leq -1$

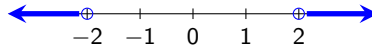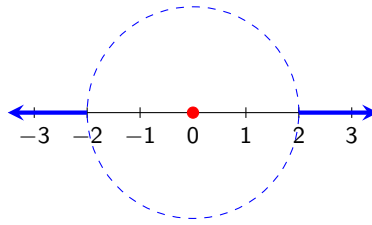## Greater Than ($>$) and Greater Than or Equal To ($\geq$)

For $|x| > 2$, we want all the values of x that are **greater than 2 units from 0** on a number line.

$|x| > 2$ means that $x < -2$ or $x > 2$

Example 2. Solve and graph each.

(a) $|2x + 3| \geq 5$

(b) $|-2x - 5| > 3$

(c) $|2x + 2| > -2$