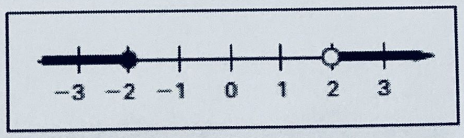
Name _____ Date _____

2-11 Solving and Graphing Compound Inequalities Algebra 1 CC

COMPOUND INEQUALITIES

Definition Two inequalities on one graph, either graphed 'inward' or 'outward'

TYPE 1: OUTWARD "OR" GRAPHS



Written: $x \leq -2$ OR $x > 2$

Interval notation: $(-\infty, -2]$ OR $(2, \infty)$

[included
(not included

I do... Modeled Example

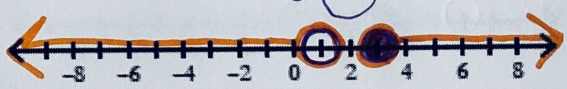
1. $-3x \leq -9$ or $5 + x < 6$

$\frac{-3x}{-3} \leq \frac{-9}{-3}$ | $\frac{5+x}{-5} < \frac{6}{-5}$

FLIP → ÷ by −

$x \geq 3$ OR $x < 1$

Look like OARS!



Interval Notation:

$(-\infty, 1)$ OR $[3, \infty)$

You Try... Independent

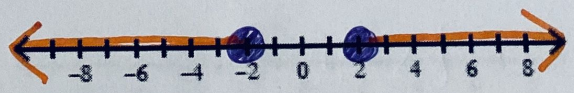
2. $3x - 6 \geq 0$ or $4x + 5 \leq -3$

$\frac{+6}{3x} \geq \frac{+6}{6}$ | $\frac{-5}{4x} \leq \frac{-5}{-8}$

$\frac{3x}{3} \geq \frac{6}{3}$ | $\frac{4x}{4} \leq \frac{-8}{4}$

$x \geq 2$ OR $x \leq -2$

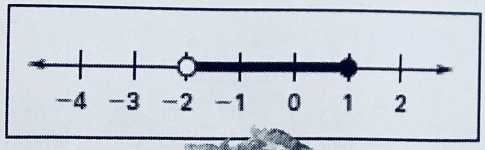
∞ never included!

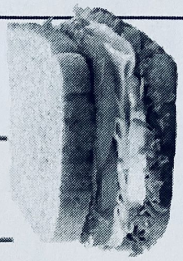


Interval Notation:

$(-\infty, -2]$ OR $[2, \infty)$

TYPE 2: INWARD "AND" GRAPHS
"sANDwich"





Written: $-2 < x \leq 1$

Interval notation: $(-2, 1]$

Fix!

I do... Modeled Example

3. $2 \leq x + 4 < 9$

$x+4 \geq 2$ AND $x+4 < 9$
$-4 \quad -4 \qquad -4 \quad -4$

$x \geq -2$ AND $x < 5$

$-2 \leq x < 5$

Interval Notation: $[-2, 5)$

You Try... Independent

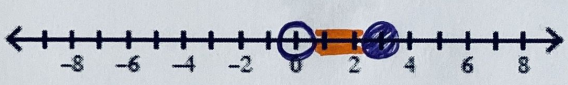
4. $1 < 4x + 1 \leq 13$

$4x+1 > 1$ AND $4x+1 \leq 13$
$-1 \quad -1 \qquad -1 \quad -1$

$\frac{4x}{4} > \frac{0}{4}$ $\qquad$ $\frac{4x}{4} \leq \frac{12}{4}$

$x > 0$ AND $x \leq 3$

$0 < x \leq 3$



Interval Notation: $(0, 3]$

What about this one?!

5. $4b + 18 \leq -12b - 14 \leq 14 - 5b$

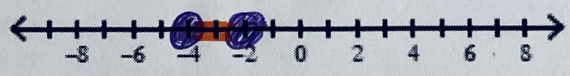
$4b+18 \leq -12b-14$ $\qquad$ $-12b-14 \leq 14-5b$
$+12b \quad +12b \qquad +5b \quad +5b$

$16b+18 \leq -14$ $\qquad$ $-7b-14 \leq 14$
$-18 \quad -18 \qquad +14 \quad +14$

$\frac{16b}{16} \leq \frac{-32}{16}$ $\qquad$ $\frac{-7b}{-7} \leq \frac{28}{-7}$

$b \leq -2$ AND $b \geq -4$

$-4 \leq b \leq -2$



Interval Notation: $[-4, -2]$