Notes:

Compound Inequalities

Created for you by M.S. Nhotsoubanh

Definitions:

1. **Compound inequality** contains at least two inequalities that are separated by either "and" or "or".

2. **Interval notation** is an alternative to expressing your answer as an inequality.

(means "not included" or "open".

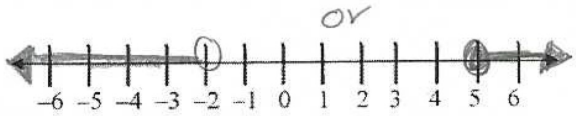
[means "included" or "closed".

Example 1: Graph $x > -4$ and $x \leq 3$ as a compound inequality. Then write it as a compound inequality and using interval notation.

$-4 < x \leq 3$ — Compound inequality

$(-4, 3]$ — Interval notation

Example 2: Graph $x < -2$ or $x \geq 5$ as a compound inequality. Then write it as a compound inequality and using interval notation.



$x < -2$ or $x \geq 5$ — Compound inequality

$(-\infty, -2)$ or $[5, \infty)$ — Interval notation

Name: Key

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Activity: Compound Inequalities

$a < x < b$ only if $a < b$
$a > x > b$ only if $a > b$
The inequalities should not point in the opposite directions as in $5 < x > 7$.

Interval Notation

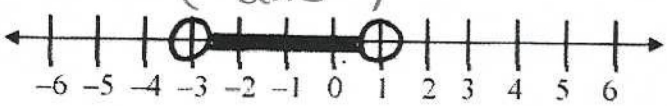
Use [or] for closed circle → ≤ , ≥

Use (or) for open circle → < , >

Directions: Write a compound inequality for each solution set shown below. Then write it in interval notation.

1

(and)



$-3 < x < 1$

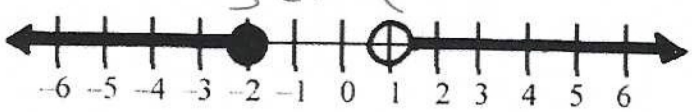
Compound inequality

$(-3, 1)$

Interval notation

2

] or (



$x \leq -2$ or $x > 1$

Compound inequality

$(-\infty, -2]$ or $(1, \infty)$

Interval notation

Name: _____

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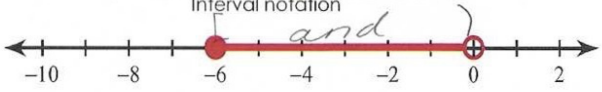
3

$-6 \leq x < 0$

Compound inequality

$[-6, 0)$

Interval notation



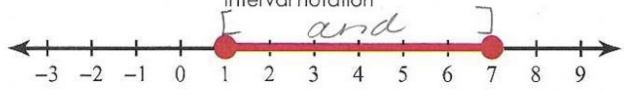
4

$1 \leq x \leq 7$

Compound inequality

$[1, 7]$

Interval notation



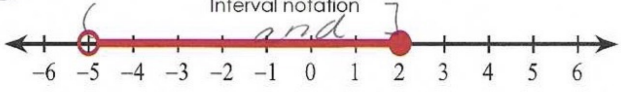
5

$-5 < x \leq 2$

Compound inequality

$(-5, 2]$

Interval notation



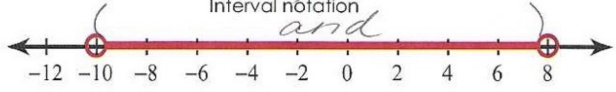
6

$-10 < x < 8$

Compound inequality

$(-10, 8)$

Interval notation



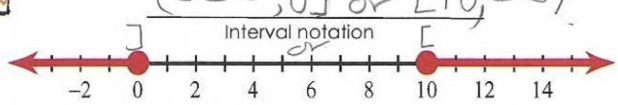
7

$x \leq 0$ or $x \geq 10$

Compound inequality

$(-\infty, 0]$ or $[10, \infty)$

Interval notation



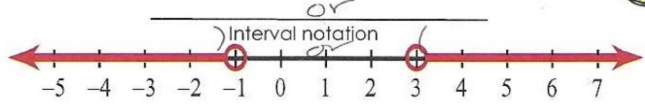
8

$x < -1$ or $x > 3$

Compound inequality

or

Interval notation



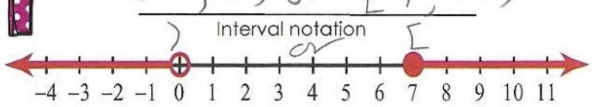
9

$x < 0$ or $x \geq 7$

Compound inequality

$(-\infty, 0)$ or $[7, \infty)$

Interval notation



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$x \leq -5$ or $x > 0$

Compound inequality

$(-\infty, -5]$ or $(0, \infty)$

Interval notation