Lesson 3.02 Interval Notation

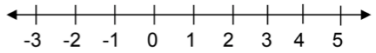
Students will be able to:

- Content Objective: Express linear inequalities in interval notation.
- Language Objective: Explain the reasoning behind open and closed brackets for interval notation.

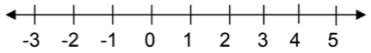
Warm Up

Represent the following inequalities on the number lines below.

a. $x \leq -1$



b. $x > 0$



Graphic Organizer

Interval Notation

When expressing a solution to an inequality, we can use a simple representation called interval notation.

"Greater than a" $x > a$ $(a, +\infty)$	"Greater than or equal to a" $x \geq a$ $[a, +\infty)$
"Less than a" $x < a$ $(-\infty, a)$	"Less than or equal to a" $x \leq a$ $(-\infty, a]$

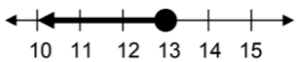
- Use [ ] for closed dots, ● (included points)
  $\leq$ or $\geq$
- Use ( ) for open dots, ○ (excluded points)
  $<$ or $>$

Interval Notation: $(-3,5]$

Skill 1: Number Lines

Write an inequality by defining a variable based on the number line and express in interval notation.

a.



Inequality: _____

Interval Notation: _____

b.

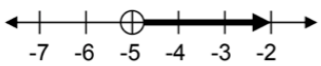
Inequality: _____

Interval Notation: _____

Exercise 1: Number Lines

Write an inequality by defining a variable based on the number line and express in interval notation.

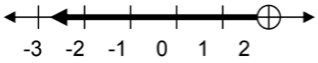
a.



Inequality: _____

Interval Notation: _____

b.



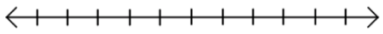
Inequality: _____

Interval Notation: _____

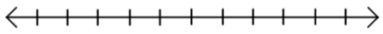
Skill 2: Graphing & Interval Notation

Given the interval notation below, graph the inequality on the number line.

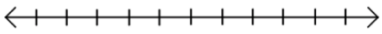
a. $(-\infty, 2]$



b. $(-3, 5)$



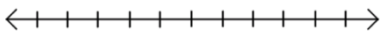
c. $(-\infty, 7)$



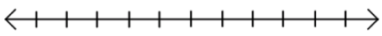
Exercise 2: Graphing & Interval Notation

Given the interval notation below, graph the inequality on the number line.

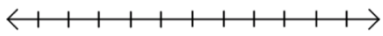
a. $[0, \infty)$



b. $(-\infty, 4)$



c. $[-7, -2)$

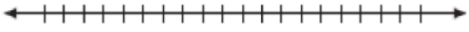


Write It Out

For a person to ride Kingda Ka at Six Flags amusement park, they must be at least 54 inches tall but no more than 74 inches tall.

a. Express the height requirement for Kingda Ka in interval notation. Explain your reasoning.

b. Graph the inequality that represents the height requirement.



Check Point

Multiple Choice

Which of the following is the correct interval notation for $x > 6$?

a. $[6, \infty)$

b. $(6, \infty)$

c. $(-\infty, 6)$

d. $(\infty, -6)$

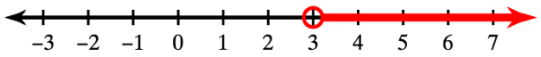
DigitLit math instruction

3.02- Problem Set

Name: _____

Multiple Choice

1. Which of the following represents the solution in interval notation?



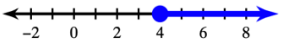
a. $(3, \infty)$

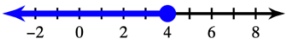
b. $(-\infty, 3)$

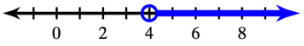
c. $[3, \infty)$

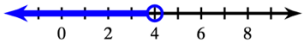
d. $(-\infty, 3]$

2. Which number line best represents the interval $(4, \infty)$?

a. 

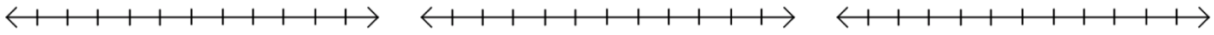
b. 

c. 

d. 

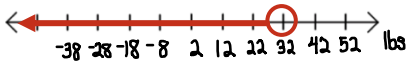
3. Given the interval notation below graph the inequality on the number line.

a. $[-1, 5]$ b. $(1, 8)$ c. $(-\infty, 0]$



4. Mario is making tomato sauce for his family and needs to crush at least 10 pounds of tomatoes. He keeps the tomatoes in his pantry that fits a maximum of 32 pounds of tomatoes.

a. What is wrong with the graph that Mario created below to represent the scenario?



b. Use interval notation to express how many tomatoes Mario can fit in his pantry and graph it on a number line.

Interval Notation: _____ Graph: