Lesson 8-5 · Session 1

# Graphing Inequalities

Name _____ Date _____ Period _____

Maryland Standard 6.AT.9 · Learning target — I can graph an inequality on a number line using an open or a closed dot.

Show a model, calculation, or explanation. Answer every part and label units when needed.

Exercises 1–12 earn 1 point for a correct response and 1 for supporting work. Spiral Review and Test Practice earn 1 point each.

## Learn from a model

**REMEMBER**

- When graphing an inequality, shade in the direction of all the solutions (the arrow shows it continues forever).
- Always plot the boundary point first (open or closed), then shade the correct direction.
- Watch out — the dot type is decided by the symbol, not by the sign of the number.
- Check it — test one value on each side of the boundary to confirm the arrow direction.

**WORKED EXAMPLE**

Graphing an Inequality with a Closed Dot A delivery van is safe when its load is at most 900 pounds. Graph the loads that are safe.

**Step 1** Write the inequality: let L = the pounds loaded, so $L \le 900$.

**Step 2** Mark the boundary point at 900 with a CLOSED dot, because 900 is allowed.

**Step 3** Solutions are 900 and everything smaller, so draw the arrow pointing left.

**Step 4** Test a point under the arrow: 875 is allowed, which confirms the direction.

**Answer L ≤ 900: a closed dot at 900 with an arrow pointing left.**

## Practice

**1.** Graph $x \le 6$ on a number line.

Graph. Mark the boundary with an open or a closed dot, then shade the arrow.

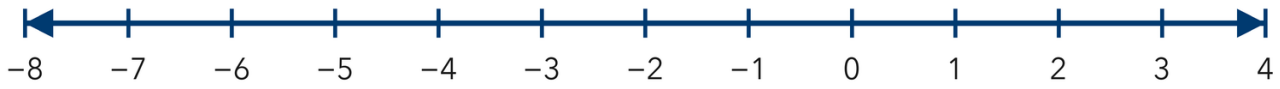



Answer _____

**SHOW YOUR THINKING**

**2.** Graph $x > -3$ on a number line.

Graph. Mark the boundary with an open or a closed dot, then shade the arrow.




Answer _____

SHOW YOUR THINKING

**3.** Write an inequality to match a graph with a closed circle at −1, shaded to the left.

Answer _____

SHOW YOUR THINKING

**4.** Write the direction the arrow points for each graph: left or right.

a. $x \geq 14$ _____
b. $n < 5$ _____
c. $p > -8$ _____
d. $k \leq 0$ _____
e. $w \geq -7$ _____

Answer _____

SHOW YOUR THINKING

**5.** Rock Wall. A rock wall lets a climber start only when the climber is at least 9 years old. Write the inequality using a and describe its graph.

Answer _____

RECORD YOUR RESPONSE

**6.** Write an inequality to match a graph with an open dot at 7 and an arrow pointing left.

Answer _____

SHOW YOUR THINKING

**7.** Cargo Elevator. A cargo elevator is safe with a load of at most 1,500 pounds. Write the inequality using L, draw a number line from 1,300 to 1,700, and graph the safe loads.

Graph. Mark the boundary with an open or a closed dot, then shade the arrow.




Answer _____

SHOW YOUR THINKING

**8.** Terrence graphed $m > 45$. He drew an open dot at 45 and then pointed his arrow to the left. Explain which part of his graph is wrong and why, then describe the corrected graph.

Answer _____

EXPLAIN WITH MATHEMATICAL EVIDENCE

**9.** Describe the graph of $n \leq 7$.

Answer _____ the graph

RECORD YOUR RESPONSE

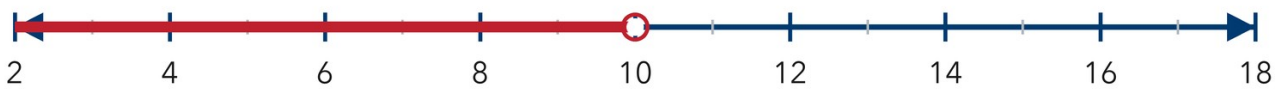
**10.** Describe the graph of $x > -2$.

Answer _____ the graph

RECORD YOUR RESPONSE

**11.** Read a Graph. A number line shows an open dot at 10 with an arrow pointing left. Write the inequality and say whether 10 is a solution.

Read the graph. This is the number line the problem describes.




Answer _____ the inequality and your answer

RECORD YOUR RESPONSE

**12.** Find the Mistake. Pat graphed $n \geq 6$ with an open dot. Explain the mistake.

Answer _____ the mistake

EXPLAIN WITH MATHEMATICAL EVIDENCE

## Spiral review

**13.** From Lesson 8-4 Session 1. Write an inequality for "at least 100."

Answer _____

SHOW YOUR THINKING

**14.** From Lesson 8-3 Session 1. Solve $5m = 65$.

Answer _____

SHOW YOUR THINKING

**15.** From Lesson 6-7 Session 1. Find the GCF of 45 and 60.

Answer _____

SHOW YOUR THINKING

## Test practice

**16.** The graph of $x \leq -4$ uses a —

| | |
|---|---|
| □ A. square | □ B. open dot |
| □ C. closed dot | □ D. cross |

**17.** For $n < 1$, the arrow points —

| | |
|---|---|
| □ A. nowhere | □ B. right |
| □ C. both ways | □ D. left |

**18.** A closed dot means the boundary value is —

| |
|---|
| □ A. a solution |
| □ B. not a solution |
| □ C. negative |
| □ D. zero |

## Check and revise

| CHECK YOUR MATHEMATICS | HOW DID IT GO? |
|---|---|
| Use a filled point when the endpoint is included and an open point when it is excluded.<br>Every part answered / Work shown / Units labeled when needed | I can do this:<br>Independently / With a hint / With help<br>Question to revisit: _____ |

One correction or question I want to discuss: _____

Test one proposed solution in the original equation or inequality. Show whether the statement is true.