

- **11.** A number *a* is to the right of a number *b* on the number line. Which is greater, -a or -b?
- **12.** A number *a* is to the left of a number *b* on the number line. Which is greater, |-a| or |-b|?

Name

2.1

Writing and Graphing Inequalities For use with Exploration 2.1

Essential Question How can you use an inequality to describe a real-life statement?



Go to BigIdeasMath.com for an interactive tool to investigate this exploration.

Work with a partner. Write an inequality for each statement. Then sketch the graph of the numbers that make each inequality true.

a. Statement The temperature *t* in Sweden is at least -10° C.



b. Statement The elevation *e* of Alabama is at most 2407 feet.



2

Inequality



EXPLORATION: Writing Inequalities

Work with a partner. Write an inequality for each graph. Then, in words, describe all the values of *x* that make each inequality true.



2.1 Writing and Graphing Inequalities (continued)



Communicate Your Answer

- **3.** How can you use an inequality to describe a real-life statement?
- **4.** Write a real-life statement that involves each inequality.

a.
$$x < 3.5$$
 b. $x \le 6$

c.
$$x > -2$$
 d. $x \ge 10$



Core Concepts

Representing Linear Inequalities



Notes:

Worked-Out Examples

Example #1

Tell whether the value is a solution of the inequality.

r + 4 > 8; r = 2 r + 4 > 8 2 + 4 > 8 $6 > 8 \times$

So, r = 2 is *not* a solution of the inequality.

Example #2

Graph the inequality.

$$-2 < w$$

2.1 Practice (continued)

Practice A

In Exercises 1–4, write the sentence as an inequality.

- **1.** Twelve is greater than or equal to five times a number *n*.
- **2.** One-third of a number *h* is less than 15.
- **3.** Seven is less than or equal to the difference of a number q and 6.
- 4. The sum of a number *u* and 14 is more than 6.

In Exercises 5 and 6, tell whether the value is a solution of the inequality.

5. d - 7 < 12; d = 19 **6.** $9 \ge 3n + 6; n = 1$

In Exercises 7–10, graph the inequality.



Date



Date

Practice B

In Exercises 1-4, write the sentence as an inequality.

- **1.** A number *x* plus 10 is more than 2.
- 2. Twelve is no less than the sum of a number *n* and 3.
- **3.** One-half of a number *p* is at least 100.
- 4. Six is greater than or equal to the quotient of a number y and 2.5.

In Exercises 5–10, tell whether the value is a solution of the inequality.

- 5. $-5 \le -\frac{z}{3}; z = 2$ 6. $\frac{10}{r} \ge 1; r = 5$ 7. $21 \ge -4t + 3; t = -6$ 8. $-9 \div (3a) > -2; a = 3$ 9. $12 < \frac{18}{3g} + 12; g = -2$ 10. $\frac{4n}{8} + 3 \le 2; n = 4$
- **11.** The winning swim team earned 245 points. The other teams earned at least 72 points less.
 - **a.** Write an inequality that represents the points that the other teams earned.
 - **b.** Was one of the teams able to earn 180 points? Explain.

In Exercises 12–17, graph the inequality.

12. $-2 \ge k$	13. −4 < <i>f</i>	14. $m \leq -3$
15. − <i>y</i> < 3	16. $\frac{1}{3} \ge j$	17. $n < - -4 $

In Exercises 18 and 19, write an inequality that represents the graph.

18.
$$-7 - 6 - 5 - 4 - 3 - 2 - 1 \ 0 \ 1$$
19. $-4 - 3 - 2 - 1 \ 0 \ 1 \ 2 \ 3 \ 4$

- **20.** An upcoming marathon's qualifying time for males age 18–34 is 3 hours.
 - **a.** Write an inequality that represents how many hours a male runner could take to run a marathon in order to qualify.
 - **b.** Will a runner with a fastest marathon time of 3 hours 9 minutes qualify for the upcoming marathon? Explain.