HOT **46. Critical Thinking** If there is no solution to a compound inequality, does the compound inequality involve OR or AND? Explain.

TEST PREP

47. Which of the following describes the solutions of $-x + 1 > 2$ OR $x - 1 > 2$?

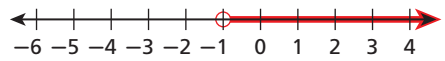
Ⓐ all real numbers greater than 1 or less than 3

Ⓑ all real numbers greater than 3 or less than 1

Ⓒ all real numbers greater than -1 or less than 3

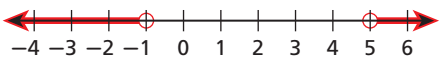
Ⓓ all real numbers greater than 3 or less than -1

48. Which of the following is a graph of the solutions of $x - 3 < 2$ AND $x + 3 > 2$?

Ⓕ 

Ⓗ 

Ⓖ 

Ⓙ 

49. Which compound inequality is shown by the graph?

Ⓐ $x \leq 2$ OR $x > 5$

Ⓑ $x < 2$ OR $x \geq 5$

Ⓒ $x \leq 2$ OR $x \geq 5$

Ⓓ $x \geq 2$ OR $x > 5$

50. Which of the following is a solution of $x + 1 \geq 3$ AND $x + 1 \leq 3$?

Ⓕ 0 Ⓖ 1 Ⓗ 2 Ⓙ 3

CHALLENGE AND EXTEND

Solve and graph each compound inequality.

51. $2c - 10 < 5 - 3c < 7c$

52. $5p - 10 < p + 6 < 3p$

53. $2s \leq 18 - s$ OR $5s \geq s + 36$

54. $9 - x \geq 5x$ OR $20 - 3x \leq 17$

55. Write a compound inequality that represents all values of x that are NOT solutions to $x < -1$ OR $x > 3$.

56. For the compound inequality $x + 2 \geq a$ AND $x - 7 \leq b$, find values of a and b for which the only solution is $x = 1$.

FOCUS ON MATHEMATICAL PRACTICES

HOT **57. Modeling** Ronaldo purchased a gym membership at a special rate that allows him at most 15 workouts per month. He has a trainer who requires him to work out at least 9 days per month. In the first half of April, Ronaldo completed d_1, workouts, with $d_1 \leq 9$. Using the variable d_2, write a compound inequality to describe how many times Ronaldo should work out in the second half of April.

HOT **58. Counterexample** While working on a problem involving inequalities, Loretta noticed $12 \leq x \leq 16$ has 4 integer solutions, 12, 13, 14, and 15, but $12 < x < 16$ has only 2 integer solutions, 13 and 14. She proposed that $a \leq x \leq b$ always has 2 more integer solutions than $a < x < b$ whenever $a < b$. Can you think of a counterexample to disprove Loretta's conjecture?