

Problem Solving

Mental Math Is each number following the inequality a solution of the given inequality?

- 1
3)
- | | | | |
|------------------------------|------------------|-------------------|------------------------------|
| 1. $v \geq -5$; 4 | 2. $0.5 > c$; 2 | 3. $b < 4$; -0.5 | 4. $d \leq \frac{17}{3}$; 5 |
| 5. $g \leq \frac{12}{5}$; 3 | 6. $k < 0$; -1 | 7. $a > 3.2$; 3 | 8. $x \geq -2.5$ |

2
3)

Is each number a solution of the given inequality?

- | | | | |
|----------------------------|--------|------------------|-------|
| 9. $3x - 7 > -1$ | a. 2 | b. 0 | c. 5 |
| 10. $4n - 3 \leq 5$ | a. 2 | b. 3 | c. -1 |
| 11. $2y + 1 < -3$ | a. 0 | b. -2 | c. 1 |
| 12. $\frac{4-m}{m} \geq 5$ | a. 0.5 | b. 2 | c. -4 |
| 13. $n(n-3) < 54$ | a. 9 | b. 3 | c. 10 |
| 14. $5(2q-8) \geq 7$ | a. -2 | b. $\frac{9}{2}$ | c. 6 |

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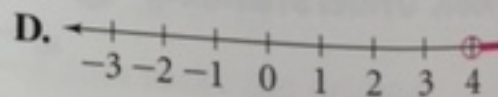
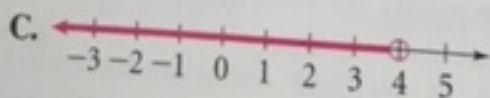
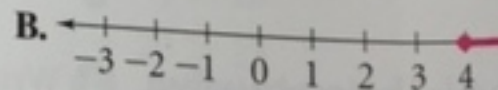
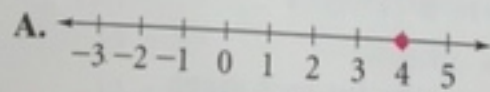
Match each inequality with its graph.

15. $x < 4$

16. $x \geq 4$

17. $x > 4$

18. $x = 4$



inequalities

Graph each inequality.

19. $x > 1$

20. $s < -3$

21. $y \leq -4$

22. $t \geq -1$

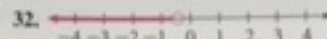
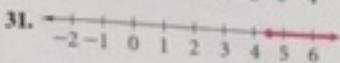
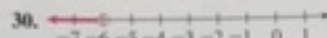
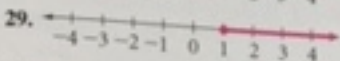
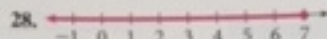
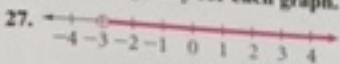
23. $-2 < d$

24. $-\frac{3}{2} \leq b$

25. $7 \geq a$

26. $4.25 > c$

Write an inequality for each graph.



Define a variable and write an inequality to model each situation.

33. A bus can seat at most 48 students.

34. In many states, you must be at least 16 years old to obtain a driver's license.

35. It is not safe to use a light bulb of more than 60 watts in this light fixture.

36. At least 350 students attended the band concert Friday night.

37. **Aviation** The Navy's flying squad, the Blue Angels, makes more than 75 appearances each year.

Write each inequality in words.

38. $n < 5$

39. $b > 0$

40. $7 \geq x$

41. $z \geq -5.6$

42. $4 > q$

43. $-1 \geq m$

44. $35 \geq w$

45. $g - 2 < 7$

46. $a \leq 3$

47. $6 + r > -2$

48. $8 \leq h$

49. $1.2 > k$

50. Writing Explain how you choose whether to draw an open or a closed dot when you graph an inequality.

51. Error Analysis A student claims that the inequality $3x + 1 > 0$ is always true because multiplying a number by three and then adding one to it makes the number greater than zero. Use a counterexample to show why the student is not correct.

52. Critical Thinking Describe how you can display the solutions of the inequality $x \neq 3$ on a number line.

53. Open-Ended Describe a situation that you can represent using the inequality $x \geq 18$.

Rewrite each inequality so that the variable is on the left. Then graph the solutions.

54. $2 < x$

55. $-5 \geq b$

56. $0 \leq r$

57. $5 > a$

Graph each inequality from the given description.

58. t is nonnegative.

59. x is positive.

60. k is no more than 3.

61. r is at least 2.

62. s is at most 4.

63. v is no less than 7.

64. Writing Explain how you interpret the phrases "at least" and "at most" in an inequality that models a real-world situation.

Use the map below for Exercises 65–66.



65. **Air Travel** You plan to go from New York City to Los Angeles. Let x be the distance in miles of any air-route between New York City and Los Angeles. The shortest route is a direct flight. Using the map, write a true statement about the mileage of any route from New York City to Los Angeles.
66. **Air Travel** Your travel agent is making plans for you to go from Chicago to New Orleans. A direct flight costs too much. Option A consists of flights from Chicago to Dallas to New Orleans. Option B consists of flights from Chicago to Orlando to New Orleans. Write an inequality comparing the mileage of these two options.
67. **Critical Thinking** Explain the difference between “4 greater than x ” and “ $4 > x$.”
68. **Critical Thinking** Which is the correct graph of $-4 < -x$? Explain.
- A. B. C. D.
69. **Reasoning** Give a counterexample for this statement. If $a < b$, then $a^2 < b^2$.
70. **Reasoning** Describe the numbers a and b for which the following statement is true. If $a < b$, then $a^2 = b^2$.
71. **Ticket Sales** Suppose your school plans a musical. The director’s goal is ticket sales of at least \$4000. Adult tickets are \$5.00 and student tickets are \$4.00. Let a represent the number of adult tickets and s represent the number of student tickets. Write an inequality that represents the director’s goal.

Graph on a number line.

72. all values of x such that $x > -2$ and $x \leq 2$
73. all values of x such that $x < -1$ or $x > 3$