

3.6 EXERCISES

PRACTICE

Solve the following linear inequalities by graphing their solution sets. See Example 1.

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|------------------------|-----------------------------------|---------------------------|
| 1. $x - 3y < 6$ | 2. $y < 2x - 1$ | 3. $x > \frac{3}{4}y$ |
| 4. $x - 3y \geq 6$ | 5. $3x - y \leq 2$ | 6. $\frac{2x - y}{4} > 1$ |
| 7. $y < -2$ | 8. $x + 1 \geq 0$ | 9. $x + y < 0$ |
| 10. $x + y > 0$ | 11. $-(y - x) > -\frac{5}{2} - y$ | 12. $-2y \leq -x + 4$ |
| 13. $5(y + 1) \geq -x$ | 14. $3x - 7y \geq 7(1 - y) + 2$ | 15. $x - y < 2y + 3$ |

Graph the solution sets that satisfy the following inequalities. See Example 2.

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| 16. $y > -3x - 6$ or $y \leq 2x - 7$ | 17. $y \geq -2$ and $y > 1$ |
| 18. $y \geq -2x - 5$ and $y \leq -6x - 9$ | 19. $y \leq 4x + 4$ and $y > 7x + 7$ |
| 20. $x - 3y \geq 6$ and $y > -4$ | 21. $x - 3y \geq 6$ or $y > -4$ |
| 22. $3x - y \leq 2$ and $x + y > 0$ | 23. $x > 1$ and $y > 2$ |
| 24. $x > 1$ or $y > 2$ | 25. $x + y > -2$ and $x + y < 2$ |
| 26. $y > -2$ and $2y > -3x - 4$ | 27. $3y > x + 2$ or $4y \leq -x - 2$ |
| 28. $y \leq -x$ and $2y + 3x > -4$ | 29. $5x + 6y < -30$ and $x \geq 2$ |
| 30. $6y - 2x > -6$ or $y > 6$ | 31. $x > -3$ or $y \geq 4$ |
| 32. $-2y < -3x - 6$ or $-3y \geq -6x - 18$ | 33. $x < 6$ and $x \geq -5$ |

Graph the solution sets that satisfy the following linear absolute value inequalities. See Example 3.

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| 34. $ x - 3 < 2$ | 35. $ x - 3 > 2$ |
| 36. $ 3y - 1 \leq 2$ | 37. $ 2x - 4 > 2$ |
| 38. $1 - y + 3 < -1$ | 39. $ x + 1 < 2$ and $ y - 3 \leq 1$ |
| 40. $ x - 3 \geq 1$ or $ y - 2 \leq 1$ | 41. $ x - y < 1$ |
| 42. $ x + y \geq 1$ | 43. $ 4x - 2y - 3 \leq 5$ |
| 44. $ 2x - 3 \geq 1$ or $ 2y + 3 \geq 1$ | 45. $ y - 3x \leq 2$ and $ y < 2$ |

Match the following inequalities to the appropriate graph.

46. $-8y + 5x \geq -8y + 5$

47. $x < -2$ and $x \geq -5$

48. $|-7x - 4y + 23| \leq 16$

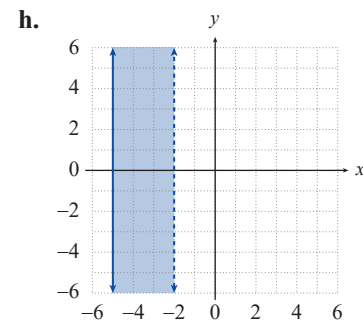
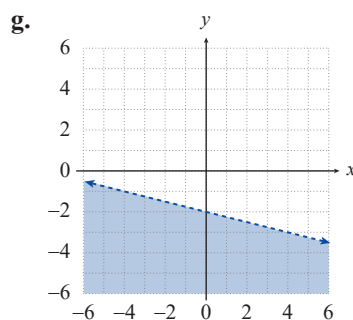
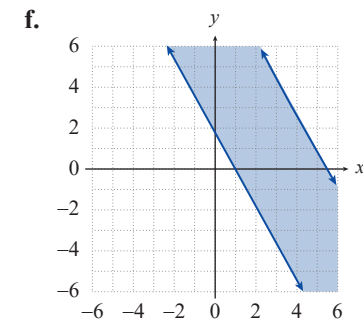
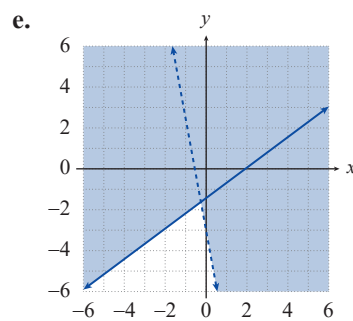
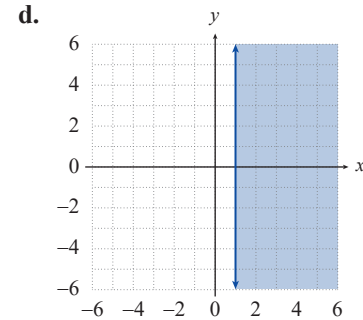
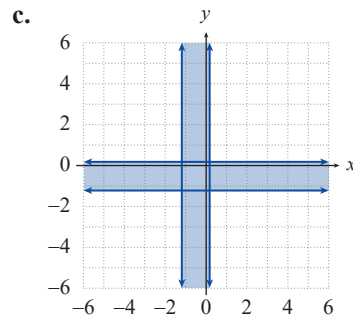
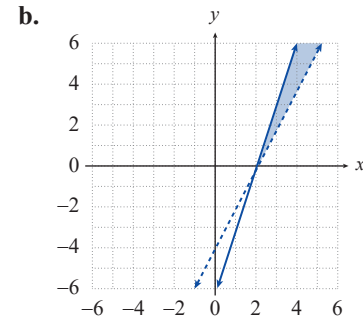
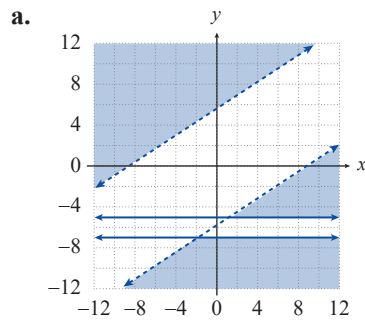
49. $y \leq 3x - 6$ and $y > 2x - 4$

50. $|3y - 2x| > 17$ and $|y + 6| \geq 1$

51. $4(y + 2) < -x$

52. $-y < 6x + 3$ or $4y \geq 3x - 6$

53. $|7x + 4| \leq 5$ or $|7y + 4| \leq 5$



 APPLICATIONS

54. It costs Happy Land Toys \$5.50 in variable costs per doll produced. If total costs must remain less than \$200, write a linear inequality describing the relationship between cost and dolls produced.
55. Trish is having a garden party where she wants to have several arrangements of lilies and orchids for decoration. The lily arrangements cost \$12 each and the orchids cost \$22 each. If Trish wants to spend less than \$150 on flowers, write a linear inequality describing the number of each arrangement she can purchase. Graph the inequality.
56. Rob has 300 feet of fencing he can use to enclose a small rectangular area of his yard for a garden. Assuming Rob may or may not use all the fencing, write a linear inequality describing the possible dimensions of his garden. Graph the inequality.
57. Flowertown Canoes produces two types of canoes. The two-person model costs \$73 to produce and the one-person model costs \$46 to produce. Write a linear inequality describing the number of each canoe the company can produce and keep costs under \$1750. Graph the inequality.