7.1 EXERCISES

PRACTICE

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

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.

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.

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

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

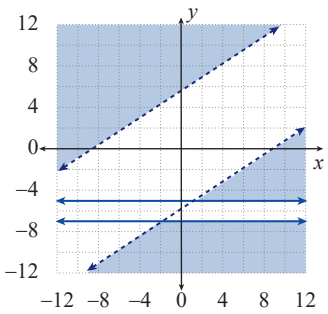
50. $\left|3y-2x\right| > 17$ and $\left|y+6\right| \geq 1$

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

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

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

a.



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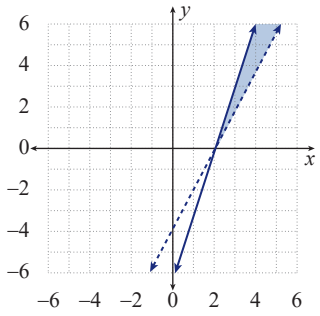

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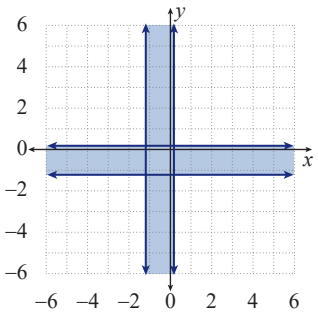

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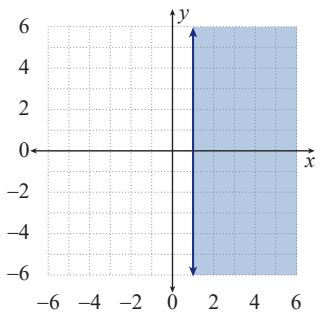

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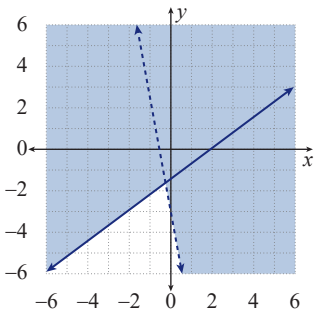

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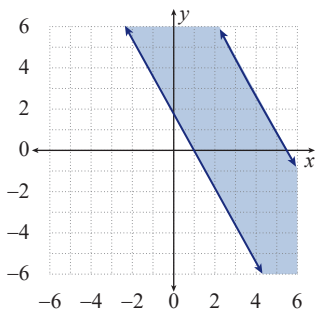

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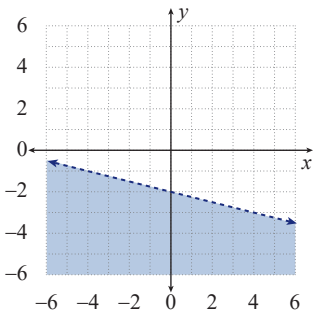

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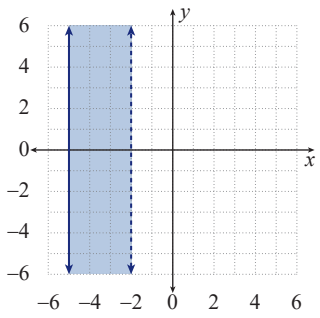

Graph the solution set of each of the following systems of inequalities.

54. $\begin{cases} y \geq -2 \\ y > 1 \end{cases}$

55. $\begin{cases} y \geq -2x - 5 \\ y \leq -6x - 9 \end{cases}$

56. $\begin{cases} y \leq 4x + 4 \\ y > 7x + 7 \end{cases}$

57. $\begin{cases} x - 3y \geq 6 \\ y > -4 \end{cases}$

58. $\begin{cases} 3x - y \leq 2 \\ x + y > 0 \end{cases}$

59. $\begin{cases} x > 1 \\ y > 2 \end{cases}$

60. $\begin{cases} x + y > -2 \\ x + y < 2 \end{cases}$

61. $\begin{cases} y > -2 \\ 2y > -3x - 4 \end{cases}$

62. $\begin{cases} y \leq -x \\ 2y + 3x > -4 \end{cases}$

63. $\begin{cases} 5x + 6y < -30 \\ x \geq 2 \end{cases}$

64. $\begin{cases} x < 6 \\ x \geq -5 \end{cases}$

65. $\begin{cases} |x + 1| < 2 \\ |y - 3| \leq 1 \end{cases}$

66. $\begin{cases} |y - 3x| \leq 2 \\ |y| < 2 \end{cases}$

APPLICATIONS

67. 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.

68. 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.

69. 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.

70. 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.