

Solve the system of equations.

1)
$$\begin{cases} x - 6y = 13 \\ -6x - 7y = 51 \end{cases}$$

2)
$$\begin{cases} -x - 2y = -4 \\ 5x + 10y = 8 \end{cases}$$

3)
$$\begin{cases} \frac{x}{3} + \frac{y}{6} = 1 \\ \frac{x}{4} - \frac{y}{8} = 0 \end{cases}$$

4)
$$\begin{cases} 7x + y = 3 \\ 2y = 6 - 14x \end{cases}$$

5)
$$\begin{cases} \frac{1}{x} + y = 12 \\ \frac{3}{x} + y = 20 \end{cases}$$

6)
$$\begin{cases} \frac{1}{x} + \frac{1}{y} = 9 \\ \frac{1}{x} - \frac{1}{y} = 1 \end{cases}$$

7)
$$\begin{cases} x + y + z = -1 \\ x - y + 3z = 1 \\ 5x + y + z = 15 \end{cases}$$

8)
$$\begin{cases} x - y + 2z = 4 \\ 4x + z = 0 \\ -x + y - 2z = -20 \end{cases}$$

9)
$$\begin{cases} y - 4z = -16 \\ 4x + y + 4z = 4 \\ -5x - 4z = 5 \end{cases}$$

10)
$$\begin{cases} 4x + 3y + z = 4 \\ 2x - 2y - z = 15 \\ 5x + y + 3z = 24 \end{cases}$$

Solve using systems of equations.

- 11) One number is 1 less than a second number. Twice the second number is 25 less than 5 times the first. Find the two numbers.
- 12) One number is 11 less than a second number. Twice the second number is 52 more than 4 times the first. Find the two numbers.
- 13) A chemist needs 150 milliliters of a 55% solution but has only 51% and 66% solutions available. Find how many milliliters of each that should be mixed to get the desired solution.
- 14) A certain aircraft can fly 1280 miles with the wind in 5 hours and travel the same distance against the wind in 8 hours. What is the speed of the wind?
- 15) A basketball player scored 26 points in a game. The number of three-point field goals the player made was 2 less than three times the number of free throws (each worth 1 point). Twice the number of two-point field goals the player made was 8 more than the number of three-point field goals made. Find the number of free-throws, two-point field goals, and three-point field goals that the player made in the game.
- 16) A store sells tents, sleeping bags, and camp stools. A customer buys a tent, 5 sleeping bags, and 3 camp stools for \$300. The price of the tent is 7 times the cost of a camp stool. The cost of a sleeping bag is \$30 more than the cost of a camp stool. Find the cost of each item.
- 17) Three trains — one eastbound, one westbound, and one northbound — leave a city at the same time. The speed of the northbound train is 20 miles per hour greater than the speed of the eastbound train. After 2 hours, the distance between the westbound train and the eastbound train is 140 miles. Twice the speed of the westbound train is 30 miles per hour more than the speed of the northbound train. Find the speeds of the three trains.

Solve the system of linear equations using matrices.

$$18) \begin{cases} -x + y = 6 \\ -2x + y = 7 \end{cases}$$

$$19) \begin{cases} x + 2y = 8 \\ 3x - 6y = 24 \end{cases}$$

$$20) \begin{cases} 6x + 5y = 1 \\ 5x - 2y = -30 \end{cases}$$

$$21) \begin{cases} 3x - 4y - z = -35 \\ x + 5y - 9z = -13 \\ 8x + y + z = 22 \end{cases}$$

$$22) \begin{cases} 9x - y + 5z = 64 \\ 8x + 3y - 7z = 69 \\ -4x - 6y + z = -80 \end{cases}$$

$$23) \begin{cases} -5x - 7y - z = -41 \\ x + 4y - 8z = 13 \\ -3x + y + z = 3 \end{cases}$$

$$24) \begin{cases} 9x - 4y + 9z = 2 \\ 2x + 5y - 3z = 4 \\ 18x - 8y + 18z = -3 \end{cases}$$

Graph the inequality.

$$25) x - y > -3$$

$$26) 5x + y \geq -3$$

$$27) 3x - 4y < -12$$

Graph the union or intersection, as indicated.

$$28) \text{The intersection of } x - y < 4 \text{ and } x > -5$$

$$29) \text{The union of } x + y \leq 0 \text{ or } 5x - 4y \geq 12$$

$$30) \text{The intersection of } -3x > y \text{ and } y > x - 5$$

$$31) \text{The union of } x + y \leq -4 \text{ or } x - y \geq -5$$

$$32) \text{The intersection of } x + y \leq 0 \text{ and } 3x - 2y \geq 2$$

Graph the solution to the system of linear inequalities.

$$33) \begin{cases} y \geq x + 4 \\ y \leq 1 - x \end{cases}$$

$$34) \begin{cases} y \leq 2x - 2 \\ y \geq -1 - x \end{cases}$$

$$35) \begin{cases} x + 5y \leq 25 \\ x \geq 4y \end{cases}$$

$$36) \begin{cases} x \leq 7 \\ y \leq 4 \end{cases}$$

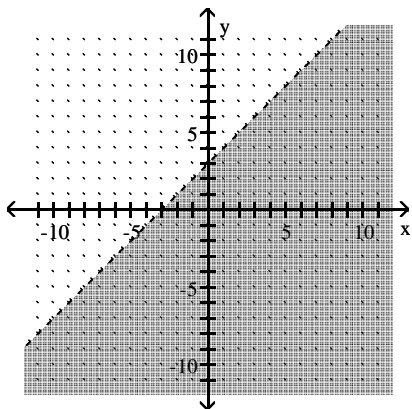
$$37) \begin{cases} y + 4x \geq 0 \\ 4x - 5y \leq 10 \\ y \leq 3 \end{cases}$$

$$38) \begin{cases} 7x + 4y \leq 28 \\ x + y \leq 6 \\ x \geq 0 \\ y \geq 0 \end{cases}$$

Answer Key

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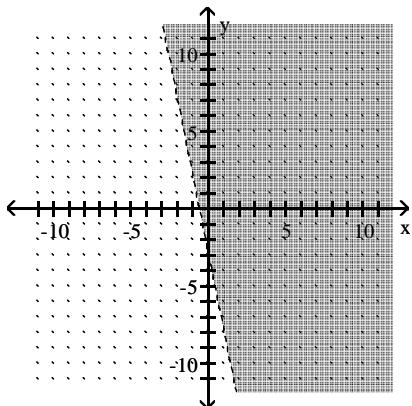
- 1) $(-5, -3)$
- 2) \emptyset
- 3) $(\frac{3}{2}, 3)$
- 4) $\{(x, y) \mid 7x + y = 3\}$
- 5) $(\frac{1}{4}, 8)$
- 6) $(\frac{1}{5}, \frac{1}{4})$
- 7) $(4, -3, -2)$
- 8) \emptyset
- 9) $(-5, 4, 5)$
- 10) $(4, -5, 3)$
- 11) 9 and 10
- 12) -15 and -4
- 13) 110 ml of 51%; 40 ml of 66%
- 14) 48 mph
- 15) 2 free throws; 6 two-point field goals; 4 three-point field goals
- 16) \$70 for a tent; \$40 for a sleeping bag; \$10 for a camp stool
- 17) eastbound, 30 mph; westbound, 40 mph; northbound, 50 mph
- 18) $(-1, 5)$
- 19) $\{(x, y) \mid 2x + y = 8\}$
- 20) $(-4, 5)$
- 21) $(1, 8, 6)$
- 22) $(7, 9, 2)$
- 23) $(1, 5, 1)$
- 24) \emptyset
- 25)



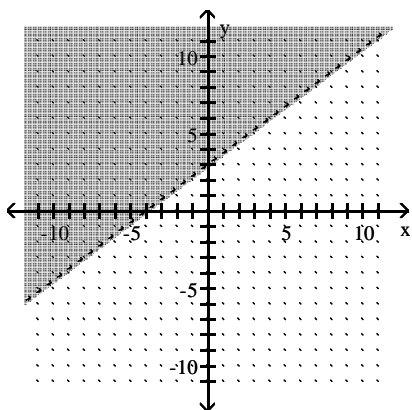
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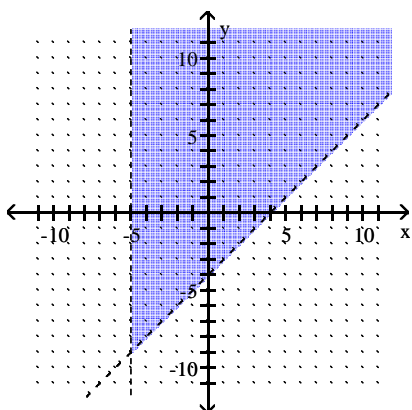
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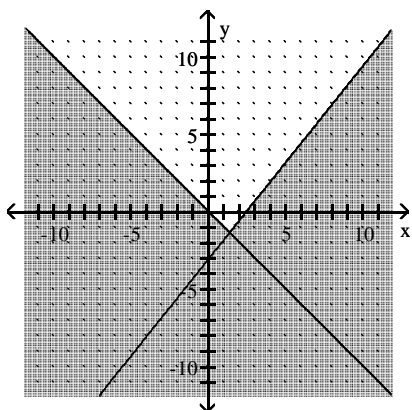
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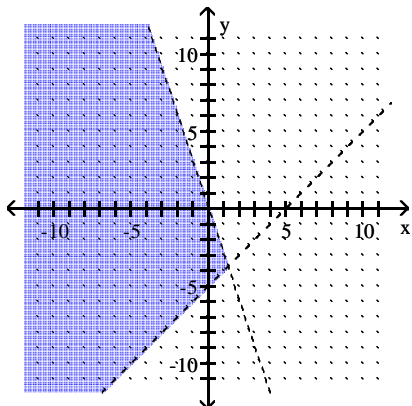
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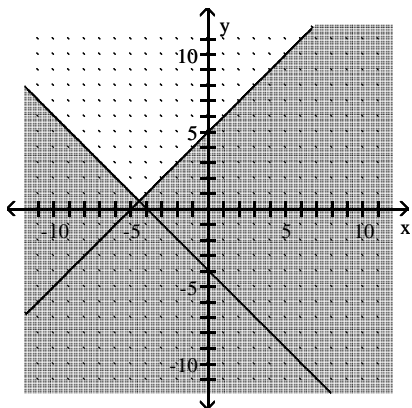
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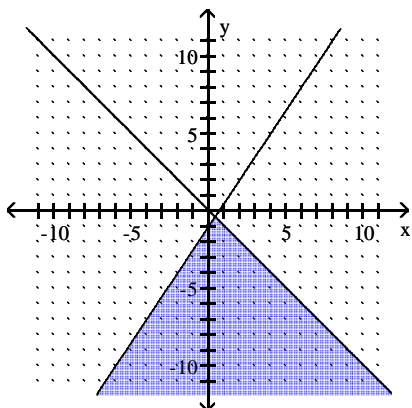
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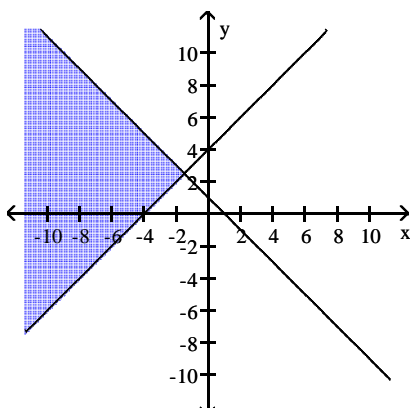
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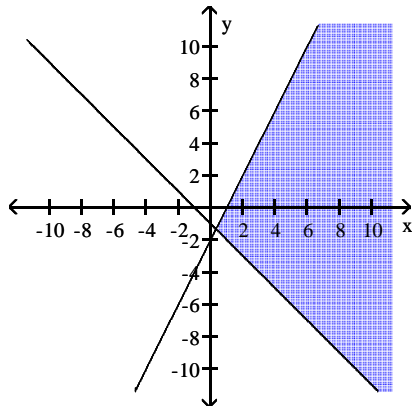
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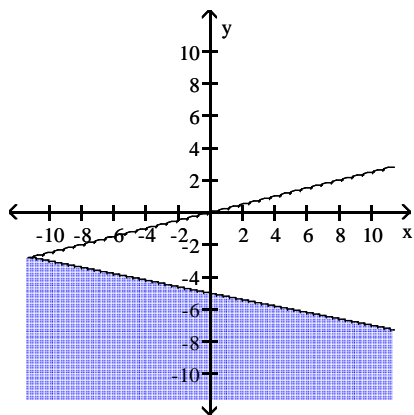
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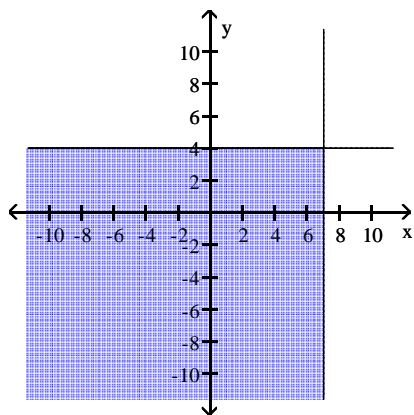
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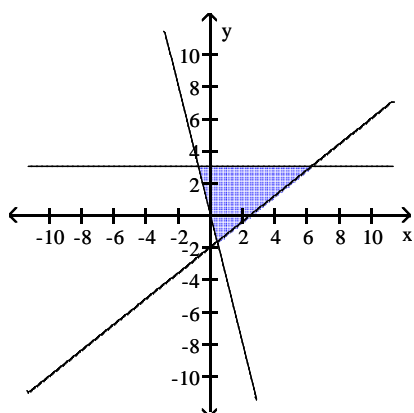
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37)



Answer Key

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38)

