

Solve the linear system using a method of your choice.

1. $-x = 10$ and $2x + 7y = 1$

2. $-3x + y = -4$ and $y = x - 6$

3. $2x + 3y = 8$ and $2x - 3y = -4$

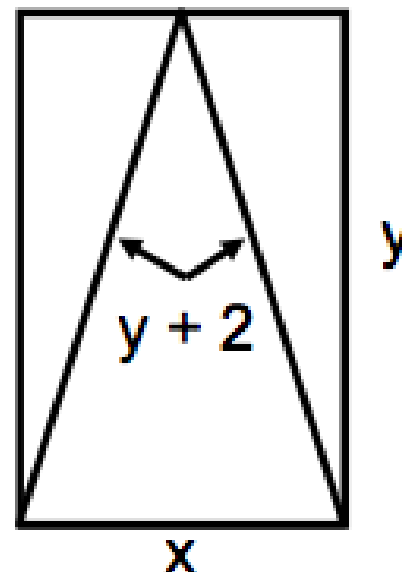
4. $-3x + 5y = -10$ and $-3x + 6y = -12$

5. $2x + 4y = -1$ and $4x - 3y = -2$

6. Suppose you invest \$10,410 in equipment to manufacture a new board game. Each game costs \$2.65 to make and sells for \$20. How many board games must you make and sell before the business breaks even?

7. A car enters highway I-94 from Grand Avenue and travels south at a constant speed of 55 mph. One hour later, another car enters at the same place and travels south at a constant speed of 65 mph. Write and solve a linear system to find the distance traveled (d) and the number of hours passed (h) before the cars are at the same point.

8. The perimeter of the rectangle is 21 inches. The perimeter of the inscribed triangle is 21 inches. Find the dimensions of the rectangle.



Solve the linear system using a method of your choice.

1. $-x = 10$ and $2x + 7y = 1$

$$x = -10 \quad 2(-10) + 7y = 1$$

$$-20 + 7y = 1$$

$$7y = 21$$

$$y = 3$$

$$(-10, 3)$$

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2. $-3x + y = -4$ and $y = x - 6$

$$-3x + x - 6 = -4$$

$$-2x - 6 = -4$$

$$-2x = 2$$

$$x = -1$$

$$y = -1 - 6$$

$$y = -7$$

$$(-1, -7)$$

Solve the linear system using a method of your choice.

3. $2x + 3y = 8$ and $2x - 3y = -4$

$$\begin{array}{r} 2x + 3y = 8 \\ + \quad 2x - 3y = -4 \\ \hline 4x = 4 \\ x = 1 \end{array}$$

$$(1, 2)$$

$$\begin{array}{r} 2(1) + 3y = 8 \\ 2 + 3y = 8 \\ 3y = 6 \\ y = 2 \end{array}$$

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$$4. (-3x + 5y = -10) \text{ and } -3x + 6y = -12$$

multiply by -1

$$3x + -5y = 10$$

$$+ \quad -3x + 6y = -12$$

$$y = -2$$

$$-3x + 6(-2) = -12$$

$$-3x + -12 = -12$$

$$-3x = 0$$

$$x = 0$$

$$(0, -2)$$

Solve the linear system using a method of your choice.

5. $(2x + 4y = -1)$ and $4x - 3y = -2$

multiply by -2

$$\begin{array}{r} -4x + -8y = 2 \\ + 4x + -3y = -2 \\ \hline -11y = 0 \\ y = 0 \end{array}$$

$$4x - 3(0) = -2$$

$$4x = -2$$

$$x = \frac{-2}{4} = -\frac{1}{2}$$

$$\left(-\frac{1}{2}, 0\right)$$

Solve the linear system using a method of your choice.

6. Suppose you invest \$10,410 in equipment to manufacture a new board game. Each game costs \$2.65 to make and sells for \$20. How many board games must you make and sell before the business breaks even?

$b = \#$ of board games

Revenue = Cost

$$20b = 10410 + 2.65b$$

$$17.35b = 10410$$

$$b = 600$$

To break even, the company needs to sell 600 games.

7. A car enters highway I-94 from Grand Avenue and travels south at a constant speed of 55 mph. One hour later, another car enters at the same place and travels south at a constant speed of 65 mph. Write and solve a linear system to find the distance traveled (d) and the number of hours passed (h) before the cars are at the same point.

Car 1 $d = 55 + 55h$ \rightarrow accounts for the 1 hour head start

Car 2 $d = 65h$

$$65h = 55 + 55h$$

$$10h = 55$$

$$h = 5.5$$

In 5.5 hours, car 2 will pull even with car 1. Both cars will have traveled 357.5 miles.

8. The perimeter of the rectangle is 21 inches. The perimeter of the inscribed triangle is 21 inches. Find the dimensions of the rectangle.

$$2x + 2y = 21 \quad \square$$

$$x + 2y + 4 = 21 \quad \triangle$$

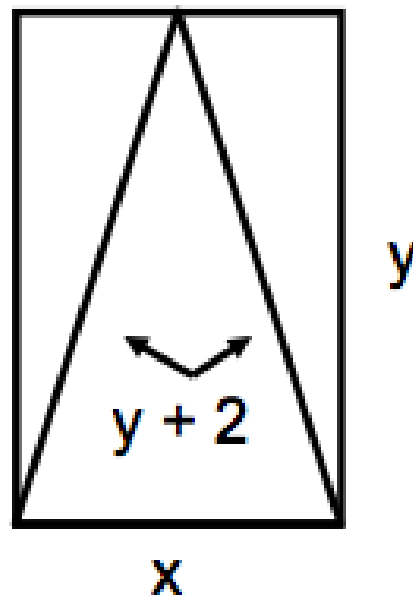
$$\hookrightarrow x + 2y = 17$$

$$2x + 2y = 21$$

$$(x + 2y = 17) \times -1$$

$$\begin{array}{r} 2x + 2y = 21 \\ + \quad - \quad x + -2y = -17 \\ \hline \end{array}$$

$$x = 4$$



$$x + 2y = 17$$

$$4 + 2y = 17$$

$$2y = 13$$

$$y = \frac{13}{2} = 6\frac{1}{2}$$