

Linear System Practice

1. Solve each linear system.

a) $\textcircled{1} 3x + 5y = 4$

$\textcircled{2} 8x + 1y = 23$

Isolate y in $\textcircled{2}$

$\textcircled{3} y = (23 - 8x)$ new $\textcircled{2}$

Sub $\textcircled{3}$ into $\textcircled{1}$

$3x + 5(23 - 8x) = 4$

$3x + 115 - 40x = 4$

$-37x + 115 = 4$

$-37x = 4 - 115$

$\rightarrow \frac{-37x}{-37} = \frac{-111}{-37}$

$\textcircled{4} x = 3$

Sub $\textcircled{4}$ into $\textcircled{3}$

$y = 23 - 8(3)$

$y = 23 - 24$

$y = -1$

\therefore The P.O.I. is $(3, -1)$

b) $\textcircled{1} 2x - 5y = -21$

$\textcircled{2} 3x + 2y = 16$

$3 \times \textcircled{1} = \textcircled{3} 6x - 15y = -63$

$2 \times \textcircled{2} = \textcircled{4} 6x + 4y = 32$

$\textcircled{3} - \textcircled{4}$

$\frac{-19y}{-19} = \frac{-95}{-19}$

$\textcircled{5} y = 5$

Sub $\textcircled{5}$ into $\textcircled{2}$

$3x + 2(5) = 16$

$3x + 10 = 16$

$3x = 16 - 10$

$\frac{3x}{3} = \frac{6}{3}$

$x = 2$

\therefore The P.O.I. is $(2, 5)$

2. Two slices of pizza and one pop costs \$6.00. Three slices of pizza and two pop costs \$9.75. How much does one slice of pizza cost?

Let x represent the cost of one slice of pizza (\$).

Let y represent the cost of one pop (\$).

$\textcircled{1} 2x + y = 6$

$\textcircled{2} 3x + 2y = 9.75$

Isolate y in $\textcircled{1}$

$\textcircled{3} y = (6 - 2x)$ new $\textcircled{1}$

Sub $\textcircled{3}$ into $\textcircled{2}$

$3x + 2(6 - 2x) = 9.75$

$\rightarrow 3x + 12 - 4x = 9.75$

$-1x + 12 = 9.75$

$-1x = 9.75 - 12$

$\frac{-1x}{-1} = \frac{-2.25}{-1}$

$\textcircled{4} x = 2.25$

Sub $\textcircled{4}$ into $\textcircled{3}$

$\rightarrow y = 6 - 2(2.25)$

$y = 6 - 4.5$

$y = 1.50$

\therefore One slice of pizza costs \$2.25.
One pop costs \$1.50.

3. Your school is hosting the District 10 Volleyball Championship. They are charging \$5 for adults and \$3 for students. A total of 350 people attend the Championship. If the revenues are \$1350, how many students attended the game?

Let x represent the number of adults.

Let y represent the number of students.

$\textcircled{1} 5x + 3y = 1350$

$\textcircled{2} x + y = 350$

Isolate x in $\textcircled{2}$

$\textcircled{3} x = (350 - y)$ new $\textcircled{2}$

Sub $\textcircled{3}$ into $\textcircled{1}$

$5(350 - y) + 3y = 1350$

$1750 - 5y + 3y = 1350$

$\rightarrow 1750 - 2y = 1350$

$-2y = 1350 - 1750$

$\frac{-2y}{-2} = \frac{-400}{-2}$

$\textcircled{4} y = 200$

Sub $\textcircled{4}$ into $\textcircled{3}$

$x = 350 - 200$

$x = 150$

\therefore There were 150 adults and 200 students.

Solving Linear Systems Practice

1. Use **substitution** to solve the following linear systems.

a) $3x - 5y = 16$

$$x = 2y + 6$$

b) $4x - y = 8$

$$2x + 3y = -10$$

c) $3x + 6y = 6$

$$5x + 8y = 4$$

2. Use **elimination** to solve the following linear systems.

a) $3x + 2y = 12$

$$4x - 2y = 44$$

b) $4x + 3y = 8$

$$2x - 2y = 4$$

c) $2x + 8y = 2$

$$5x - 10y = 35$$

Answers: 1a) (2, -2)

b) (1, -4)

c) (-4, 3)

2. a) (8, -6)

b) (2, 0)

c) (5, -1)