

Algebra 2 CP Worksheet Section 3.2 Part 3

Solve each system of equations using any method (graphing, substitution, or elimination).

1. $2x - 3y = 4$
 $+ 8x + 3y = 1$ Elimination

$$\frac{10x}{10} = \frac{5}{10}$$

$$x = \frac{5}{10} = \frac{1}{2}$$

$$\boxed{x = \frac{1}{2}}$$

$$8x + 3y = 1$$

$$\frac{8}{2} \left(\frac{1}{2} \right) + 3y = 1$$

$$4 + 3y = 1$$

$$-4 \quad -4$$

$$\frac{3y}{3} = \frac{-3}{3} \quad \boxed{y = -1}$$

2. $4x + 6y = 8$
 $3x + y = 9$ Substitution

$$-3x \quad -3x$$

$$y = 9 - 3x$$

$$= 9 - 3\left(\frac{23}{7}\right)$$

$$= \frac{9 \cdot 7}{1 \cdot 7} - \frac{69}{7}$$

$$= \frac{63}{7} - \frac{69}{7} = \frac{-6}{7}$$

$$\boxed{y = \frac{-6}{7}}$$

$$4x + 6(9 - 3x) = 8$$

$$4x + 54 - 18x = 8$$

$$-14x + 54 = 8$$

$$-54 \quad -54$$

$$\frac{-14x}{-14} = \frac{-46}{-14}$$

$$x = \frac{-46 \div -2}{-14 \div -2} = \frac{23}{7}$$

$$\boxed{x = \frac{23}{7}}$$

3. $2x + 8y = 8$
 $3x - 2y = -16$ Elimination

$$2x + 8y = 8$$

$$+12x - 8y = -64$$

$$\frac{14x}{14} = \frac{-56}{14}$$

$$\boxed{x = -4}$$

$$2x + 8y = 8$$

$$2(-4) + 8y = 8$$

$$-8 + 8y = 8$$

$$+8 \quad +8$$

$$\frac{8y}{8} = \frac{16}{8}$$

$$\boxed{y = 2}$$

Algebra 2 CP Worksheet Section 3.2 Part 3

Elimination

$$\begin{array}{r} 4 \cdot 2(6x - 3y = 1) \rightarrow -12x + 6y = -2 \\ 3(4x - 2y = 7) \rightarrow 12x - 6y = 21 \\ \hline \end{array}$$

$$0 = 19$$

NO SOLUTION

Elimination

$$\begin{array}{r} 5 \cdot 3(3x + 4y = -6) \rightarrow 15x + 20y = -30 \\ 4(2x - 5y = 19) \rightarrow + 8x - 20y = 76 \\ \hline \end{array}$$

$$\frac{23x}{23} = \frac{46}{23}$$

x = 2

$$3(2) + 4y = -6$$

$$\begin{array}{r} 6 + 4y = -6 \\ -6 \quad -6 \end{array}$$

$$\frac{4y}{4} = \frac{-12}{4}$$

y = -3

6. $2x + 5y = 1$

Substitution

$$x + \frac{5}{2}y = \frac{1}{2}$$

$$-\frac{5}{2}y \quad -\frac{5}{2}y$$

$$x = \frac{1}{2} - \frac{5}{2}y$$

$$2\left(\frac{1}{2} - \frac{5}{2}y\right) + 5y = 1$$

$$2 \cdot \frac{1}{2} - 2 \cdot \frac{5}{2}$$

$$1 - 5y + 5y = 1$$

$$1 = 1$$

Infinite Solutions

Algebra 2 CP Worksheet Section 3.2 Part 3

Define the variables, write a system of equations, and solve.

7. SJCA is selling tickets to a talent show. On the first day of ticket sales the school sold 10 senior citizen tickets and 11 student tickets for a total of \$190. The school took in \$160 on the second day by selling 5 senior citizen tickets and 12 student tickets. Find the price of a senior citizen ticket and the price of a student ticket.

Let $x =$ ^{price of} Senior citizen tickets & $y =$ ^{price of} Student tickets

Elimination:

$$\begin{array}{r} 10x + 11y = 190 \\ -2(5x + 12y = 160) \rightarrow -10x - 24y = -320 \\ \hline -13y = -130 \\ -13 \quad -13 \\ \hline \boxed{y = 10} \end{array}$$

B 8 for senior citizens
 $\frac{1}{2}$ 810 for student tickets

$$\begin{array}{r} 5x + 12y = 160 \\ 5x + 12(10) = 160 \\ 5x + 120 = 160 \\ -120 \quad -120 \\ \hline 5x = 40 \\ \frac{5x}{5} = \frac{40}{5} \quad \boxed{x = 8} \end{array}$$

8. Mrs. Holliday and Mrs. Ollic are selling cheesecakes for a Junior Class fundraiser. Customers can buy plain cheesecakes and Oreo cheesecakes. Mrs. Holliday sold 2 plain cheesecakes and 8 Oreo cheesecakes for a total of \$168. Mrs. Ollic sold 4 plain cheesecakes and 7 Oreo cheesecakes for a total of \$174. Find the cost of each type of cheesecake.

Let $x =$ cost of plain cheesecake & $y =$ cost of Oreo cheesecake

Elimination
 $\frac{168}{2}$
 $\frac{336}{x}$

$$\begin{array}{r} -2(2x + 8y = 168) \rightarrow -4x - 16y = -336 \\ 4x + 7y = 174 \\ \hline -9y = -162 \\ -9 \quad -9 \\ \hline \boxed{y = 18} \end{array}$$

B 12 for plain
 $\frac{1}{2}$ 810 for Oreo Cheesecake

$$\begin{array}{r} 2x + 8y = 168 \\ 2x + 8(18) = 168 \\ 2x + 144 = 168 \\ -144 \quad -144 \\ \hline 2x = 24 \\ \frac{2x}{2} = \frac{24}{2} \quad \boxed{x = 12} \end{array}$$

9. Two schools are planning a trip to downtown Charleston. The first school rents and fills 2 buses and 4 vans with 152 students. The second school rents and fills 3 buses and 1 van with 168 students. If every van has the same number of students, and every bus has the same number of students, then how many students can each vehicle carry?

Let $x =$ students in bus & $y =$ students in vans.

substitution

$$\begin{array}{r} 2x + 4y = 152 \\ 3x + 1y = 168 \\ -3x \quad -3x \\ \hline y = 168 - 3x \\ y = 168 - 3(52) \\ = 168 - 156 \\ \boxed{y = 12} \end{array}$$

$$\begin{array}{r} 2x + 4y = 152 \\ 2x + 4(168 - 3x) = 152 \\ 2x + 672 - 12x = 152 \\ -10x + 672 = 152 \\ -672 \quad -672 \\ \hline -10x = -520 \\ \frac{-10x}{-10} = \frac{-520}{-10} \quad \boxed{x = 52} \end{array}$$

$\frac{2}{3}$
 $\frac{168}{x}$
 $\frac{112}{672}$

Buses can hold 52 students &
 Vans can hold 12 students.

