

NAME:

DATE:

Key

A2.Q1.BERMEL:

SYSTEMS OF EQUATIONS

(DAY 52)

NOTES

Elimination

what you **NEED**:

- Both equations are in Standard Form

$$Ax + By = C$$

- Opposite coefficients on one of the variables

$$\begin{array}{c} -3x \\ 3x \end{array} \quad \text{OR} \quad \begin{array}{c} 5y \\ -5y \end{array}$$

what you **DO**:

- Combine the equations to eliminate one of the variables. Solve.
- Substitute your answer into an original equation.

Substitution

what you **NEED**:

- One equation solved for a variable $X =$ OR $Y =$

what you **DO**:

- Substitute your solved equation into the other equation. Solve.
- Substitute your answer into an original equation.

1. Solve the system of equations using the method of **elimination**.

$$\begin{aligned} -1(5x + 2y &= 57) \\ 4x + 2y &= 48 \end{aligned}$$

$$\begin{aligned} -5x - 2y &= -57 \\ 4x + 2y &= 48 \\ \hline -1x &= -9 \\ \hline x &= 9 \end{aligned}$$

Multiply by
-1 to change
the sign

$$\boxed{x = 9}$$

plug this into one of
the original equations.

$$4(9) + 2y = 48$$

$$\begin{aligned} 36 + 2y &= 48 \\ -36 & \quad -36 \end{aligned}$$

$$\frac{2y}{2} = \frac{12}{2}$$

$$\boxed{y = 6}$$

Final Answer
($x = 9$, $y = 6$)

2. Solve the system of equations using the method of **elimination**.

$$\begin{aligned} -2(x + y &= 200) \\ 3x + 2y &= 570 \end{aligned}$$

$$\begin{aligned} -2x - 2y &= -400 \\ 3x + 2y &= 570 \\ \hline x &= 170 \end{aligned}$$

Multiply by
-2 to get
opposite coefficients

plug this into one of the
original equations

$$\begin{aligned} (170) + y &= 200 \\ -170 & \quad -170 \end{aligned}$$

$$\boxed{y = 30}$$

Final Answer
($x = 170$, $y = 30$)

3. Solve the system of equations using the method of **elimination**.

$$\begin{array}{rcl} 3(2x + 7y = 8) & 6x + 21y = 24 \\ -6x + 4y = 26 & \hline \end{array}$$

$$\frac{25y}{25} = \frac{50}{25}$$

$$\boxed{y = 2}$$

plug this into one of the original equations.

$$2x + 7(2) = 8$$

$$\begin{array}{r} 2x + 14 = 8 \\ -14 \quad -14 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{-6}{2}$$

$$\boxed{x = -3}$$

Final Answer
($x = -3$, $y = 2$)

4. Solve the system of equations using the method of **substitution**.

$$4x - 7y = 9$$

$$\boxed{y = x - 3}$$

plug this into the top

$$4x - 7(x - 3) = 9$$

$$4x - 7x + 21 = 9$$

$$\begin{array}{r} -3x + 21 = 9 \\ -21 \quad -21 \\ \hline \end{array}$$

$$\frac{-3x}{-3} = \frac{-12}{-3}$$

$$\boxed{x = 4}$$

plug this into the original equation.

$$\begin{array}{l} y = (4) - 3 \\ \boxed{y = 1} \end{array}$$

Final Answer
($x = 4$, $y = 1$)

5. Solve the system of equations using the method of **substitution**.

$$\begin{aligned} x - y &= 5 \\ y &= 4x - 11 \end{aligned}$$

$$x - (4x - 11) = 5$$

$$x - 4x + 11 = 5$$

$$-3x + 11 = 5$$

$$\underline{-11} \quad \underline{-11}$$

$$\underline{-3x} = \underline{-6}$$

$$\underline{-3} \quad \underline{-3}$$

$$\boxed{x = 2}$$

$$y = 4(2) - 11$$

$$y = 8 - 11$$

$$\boxed{y = -3}$$

Final Answer
($x = 2$, $y = -3$)

6. Solve the system of equations using the method of **substitution**.

$$\begin{aligned} y &= 2x - 4 \\ 6x - 2y &= -10 \end{aligned}$$

$$6x - 2(2x - 4) = -10$$

$$6x - 4x + 8 = -10$$

$$2x + 8 = -10$$

$$\underline{-8} \quad \underline{-8}$$

$$\underline{2x} = \underline{-18}$$

$$\underline{2} \quad \underline{2}$$

$$\boxed{x = -9}$$

$$y = 2(-9) - 4$$

$$y = -18 - 4$$

$$\boxed{y = -22}$$

Final Answer
($x = -9$, $y = -22$)