

AA PREP: SYSTEMS OF LINEAR EQUATIONS—WORKSHEET #1

KEY

Solve each system using the specified method. Each system may have one solution, no solution, or infinitely many solutions.

1. Solve by graphing.

$$\begin{cases} y = -x + 1 \\ y = 2x - 5 \end{cases}$$

(2, -1)

2. Solve by graphing.

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

SAME LINE

INFINITELY MANY SOLUTIONS

3. Solve by substitution.

$$\begin{cases} y = -2x - 9 \\ 6x - 5y = -19 \end{cases}$$

$$6x - 5(-2x - 9) = -19$$

$$6x + 10x + 45 = -19$$

$$16x + 45 = -19$$

$$16x = -64 \quad x = -4$$

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

$$y = 8 - 9$$

$$y = -1$$

(-4, -1)

4. Solve by substitution.

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

$$4(6y - 7) + y = -3$$

$$24y - 28 + y = -3$$

$$25y - 28 = -3$$

$$25y = 25$$

$$y = 1$$

$$x = 6(1) - 7$$

$$x = 6 - 7$$

$$x = -1$$

(-1, 1)

5. Solve by elimination.

$$\begin{cases} 2x - 2y = 4 \\ -x + y = -2 \end{cases}$$

SAME LINE

$$\begin{array}{r} \oplus \downarrow \\ 2x - 2y = 4 \\ -2x + 2y = -4 \\ \hline 0 = 0 \\ \text{True!} \end{array}$$

INFINITELY MANY SOLUTIONS

6. Solve by elimination.

$$\begin{cases} 3(-2x + 4y) = (1)^3 \\ 2(3x - 6y) = (9)^2 \end{cases}$$

$$\begin{array}{r} \oplus \downarrow \\ -6x + 12y = 3 \\ 6x - 12y = 18 \\ \hline 0 = 21 \\ \text{FALSE!} \end{array}$$

PARALLEL LINES

NO SOLUTION

7. Solve using any method.

$$\begin{cases} -18x + 6y = 24 \\ 3x - y = -2 \end{cases}$$

PARALLEL LINES

$$\begin{array}{r} \oplus \downarrow \\ -18x + 6y = 24 \\ 18x - 6y = -12 \\ \hline 0 = 12 \\ \text{FALSE!} \end{array}$$

NO SOLUTION

8. Solve using any method.

$$\begin{cases} -3(2x - 2y) = (16) - 3 \\ 3x - 6y = 30 \end{cases}$$

$$2(6) - 2y = 16$$

$$12 - 2y = 16$$

$$-2y = 4$$

$$y = -2$$

$$3x - 6(-2) = 30$$

$$3x + 12 = 30$$

$$3x = 18$$

$$x = 6$$

(6, -2)