

Solving Systems of Equations by Elimination

Solve each system by elimination.

1)
$$\begin{aligned} -4x - 2y &= -12 \\ 4x + 8y &= -24 \end{aligned}$$

2)
$$\begin{aligned} 4x + 8y &= 20 \\ -4x + 2y &= -30 \end{aligned}$$

3)
$$\begin{aligned} x - y &= 11 \\ 2x + y &= 19 \end{aligned}$$

4)
$$\begin{aligned} -6x + 5y &= 1 \\ 6x + 4y &= -10 \end{aligned}$$

5)
$$\begin{aligned} -2x - 9y &= -25 \\ -4x - 9y &= -23 \end{aligned}$$

6)
$$\begin{aligned} 8x + y &= -16 \\ -3x + y &= -5 \end{aligned}$$

7)
$$\begin{aligned} -6x + 6y &= 6 \\ -6x + 3y &= -12 \end{aligned}$$

8)
$$\begin{aligned} 7x + 2y &= 24 \\ 8x + 2y &= 30 \end{aligned}$$

9)
$$\begin{aligned} 5x + y &= 9 \\ 10x - 7y &= -18 \end{aligned}$$

10)
$$\begin{aligned} -4x + 9y &= 9 \\ x - 3y &= -6 \end{aligned}$$

11)
$$\begin{aligned} -3x + 7y &= -16 \\ -9x + 5y &= 16 \end{aligned}$$

12)
$$\begin{aligned} -7x + y &= -19 \\ -2x + 3y &= -19 \end{aligned}$$

Solving Systems of Equations by Elimination

Solve each system by elimination.

$$\begin{array}{r} 1) \quad -4x - 2y = -12 \\ \quad \quad 4x + 8y = -24 \\ \hline \quad \quad 6y = -36 \\ \quad \quad \quad \quad 6 \quad \quad 6 \\ \hline \quad \quad \quad \quad y = -6 \end{array}$$

$$\begin{array}{r} 4x + 8(-6) = -24 \\ 4x - 48 = -24 \\ +48 \quad +48 \\ \hline 4x = 24 \\ \quad \quad 4 \quad \quad 4 \\ \hline x = 6 \end{array}$$

$(6, -6)$

$$\begin{array}{r} 2) \quad 4x + 8y = 20 \\ \quad \quad -4x + 2y = -30 \\ \hline \quad \quad 10y = -10 \\ \quad \quad \quad \quad 10 \quad \quad 10 \\ \hline \quad \quad \quad \quad y = -1 \end{array}$$

$$\begin{array}{r} 4x + 8(-1) = 20 \\ 4x - 8 = 20 \\ +8 \quad +8 \\ \hline 4x = 28 \\ \quad \quad 4 \quad \quad 4 \\ \hline x = 7 \end{array}$$

$(7, -1)$

$$\begin{array}{r} 3) \quad x - y = 11 \\ \quad \quad + 2x + y = 19 \\ \hline \quad \quad 3x = 30 \\ \quad \quad \quad \quad 3 \quad \quad 3 \\ \hline \quad \quad \quad \quad x = 10 \end{array}$$

$$\begin{array}{r} x - y = 11 \\ -10 \quad -10 \\ \hline -y = 1 \\ \quad \quad -1 \quad -1 \\ \hline \quad \quad \quad \quad y = -1 \end{array}$$

$(10, -1)$

$$\begin{array}{r} 4) \quad -6x + 5y = 1 \\ \quad \quad + 6x + 4y = -10 \\ \hline \quad \quad 9y = -9 \\ \quad \quad \quad \quad 9 \quad \quad 9 \\ \hline \quad \quad \quad \quad y = -1 \end{array}$$

$$\begin{array}{r} -6x + 5y = 1 \\ -6x + 5(-1) = 1 \\ -6x - 5 = 1 \\ +5 \quad +5 \\ \hline -6x = 6 \\ \quad \quad -6 \quad -6 \\ \hline x = -1 \end{array}$$

$(-1, -1)$

$$\begin{array}{r} 5) \quad (-2x - 9y = -25) \\ \quad \quad -4x - 9y = -23 \\ \hline \quad \quad + 2x + 9y = 25 \\ \hline \quad \quad -2x = 2 \\ \quad \quad \quad \quad -2 \quad -2 \\ \hline \quad \quad \quad \quad x = -1 \end{array}$$

$$\begin{array}{r} -4x - 9y = -23 \\ -4(-1) - 9y = -23 \\ 4 - 9y = -23 \\ -4 \quad -4 \\ \hline -9y = -27 \\ \quad \quad -9 \quad -9 \\ \hline \quad \quad \quad \quad y = 3 \end{array}$$

$(-1, 3)$

$$\begin{array}{r} 6) \quad (8x + y = -16) \\ \quad \quad -3x + y = -5 \\ \hline \quad \quad -8x - y = 16 \\ \hline \quad \quad -11x = 11 \\ \quad \quad \quad \quad -11 \quad -11 \\ \hline \quad \quad \quad \quad x = -1 \end{array}$$

$$\begin{array}{r} -3x + y = -5 \\ -3(-1) + y = -5 \\ 3 + y = -5 \\ -3 \quad -3 \\ \hline y = -8 \end{array}$$

$(-1, -8)$

$$\begin{array}{r} 7) \quad (-6x + 6y = 6) \\ \quad \quad + 6x + 3y = -12 \\ \hline \quad \quad -3y = -18 \\ \quad \quad \quad \quad -3 \quad -3 \\ \hline \quad \quad \quad \quad y = 6 \end{array}$$

$$\begin{array}{r} -6x + 3y = -12 \\ -6x + 3(6) = -12 \\ -6x + 18 = -12 \\ -18 \quad -18 \\ \hline -6x = -30 \\ \quad \quad -6 \quad -6 \\ \hline \quad \quad \quad \quad x = 5 \end{array}$$

$(5, 6)$

$$\begin{array}{r} 8) \quad (7x + 2y = 24) \\ \quad \quad 8x + 2y = 30 \\ \hline \quad \quad -7x - 2y = -24 \\ \hline \quad \quad x = 6 \end{array}$$

$$\begin{array}{r} 7x + 2y = 24 \\ 7(6) + 2y = 24 \\ 42 + 2y = 24 \\ -42 \quad -42 \\ \hline 2y = -18 \\ \quad \quad 2 \quad 2 \\ \hline \quad \quad \quad \quad y = -9 \end{array}$$

$(6, -9)$

$$\begin{array}{r} 9) \quad (5x + y = 9) \\ \quad \quad 10x - 7y = -18 \\ \hline \quad \quad -16x - 2y = -18 \\ \hline \quad \quad -9y = -36 \\ \quad \quad \quad \quad -9 \quad -9 \\ \hline \quad \quad \quad \quad y = 4 \end{array}$$

$$\begin{array}{r} 5x + y = 9 \\ 5x + 4 = 9 \\ -4 \quad -4 \\ \hline 5x = 5 \\ \quad \quad 5 \quad 5 \\ \hline \quad \quad \quad \quad x = 1 \end{array}$$

$(1, 4)$

$$\begin{array}{r} 10) \quad -4x + 9y = 9 \\ \quad \quad 3(x - 3y) = -6 \\ \hline \quad \quad 3x - 9y = -6 \\ \hline \quad \quad -4x + 9y = 9 \\ \hline \quad \quad -x = -9 \\ \quad \quad \quad \quad -1 \quad -1 \\ \hline \quad \quad \quad \quad x = 9 \end{array}$$

$$\begin{array}{r} x - 3y = -6 \\ 9 - 3y = -6 \\ -9 \quad -9 \\ \hline -3y = -15 \\ \quad \quad -3 \quad -3 \\ \hline \quad \quad \quad \quad y = 5 \end{array}$$

$(9, 5)$

$$\begin{array}{r} 11) \quad (-3x + 7y = -16) \\ \quad \quad -9x + 5y = 16 \\ \hline \quad \quad + 9x - 21y = 48 \\ \hline \quad \quad -16y = 64 \\ \quad \quad \quad \quad -16 \quad -16 \\ \hline \quad \quad \quad \quad y = -4 \end{array}$$

$$\begin{array}{r} -9x + 5y = 16 \\ -9x + 5(-4) = 16 \\ -9x - 20 = 16 \\ +20 \quad +20 \\ \hline -9x = 36 \\ \quad \quad -9 \quad -9 \\ \hline \quad \quad \quad \quad x = -4 \end{array}$$

$(-4, -4)$

$$\begin{array}{r} 12) \quad (-7x + y = -19) \\ \quad \quad -2x + 3y = -19 \\ \hline \quad \quad 21x - 3y = 57 \\ \hline \quad \quad 19x = 38 \\ \quad \quad \quad \quad 19 \quad 19 \\ \hline \quad \quad \quad \quad x = 2 \end{array}$$

$$\begin{array}{r} -2x + 3y = -19 \\ -2(2) + 3y = -19 \\ -4 + 3y = -19 \\ +4 \quad +4 \\ \hline 3y = -15 \\ \quad \quad 3 \quad 3 \\ \hline \quad \quad \quad \quad y = -5 \end{array}$$

$(2, -5)$