

## Solving Systems of Equations by Elimination (+/-)

Name: \_\_\_\_\_

Use elimination to solve each system of equations.

$$\begin{array}{r}
 1. \quad x - y = 1 \\
 + \quad x + y = -9 \\
 \hline
 2x = -8 \\
 x = -4 \\
 \\
 -4 + y = -9 \\
 +4 \quad +4 \\
 \hline
 y = -5 \\
 \boxed{(-4, -5)}
 \end{array}$$

$$\begin{array}{r}
 2. \quad p + q = -2 \\
 + \quad p - q = 8 \\
 \hline
 2p = 6 \\
 p = 3 \\
 \\
 3 + q = -2 \\
 -3 \quad -3 \\
 \hline
 q = -5 \\
 \boxed{(3, -5)}
 \end{array}$$

$$\begin{array}{r}
 3. \quad 4x + y = 23 \\
 + \quad 3x - y = 12 \\
 \hline
 7x = 35 \\
 x = 5 \\
 \\
 4(5) + y = 23 \\
 20 + y = 23 \\
 y = 3 \\
 \boxed{(5, 3)}
 \end{array}$$

$$\begin{array}{r}
 4. \quad 2x + 5y = -3 \quad -3 + 6 \\
 - \quad 2x + 2y = 6 \\
 \hline
 3y = -9 \\
 y = -3 \\
 \\
 2x + 5(-3) = -3 \\
 2x - 15 = -3 \\
 +15 \quad +15 \\
 \hline
 2x = 12 \\
 x = 6 \\
 \boxed{(6, -3)}
 \end{array}$$

$$\begin{array}{r}
 5. \quad 3x + 2y = -1 \quad -1 + 6 \\
 - \quad 4x + 2y = -6 \\
 \hline
 -1x = 5 \\
 x = -5 \\
 \\
 3(-5) + 2y = -1 \\
 -15 + 2y = -1 \\
 +15 \quad +15 \\
 \hline
 2y = 14 \\
 y = 7 \\
 \boxed{(-5, 7)}
 \end{array}$$

$$\begin{array}{r}
 6. \quad 5x + 3y = 22 \quad 3 - 2 \\
 - \quad 5x - 2y = 2 \\
 \hline
 5y = 20 \\
 \frac{5y}{5} = \frac{20}{5} \\
 y = 4 \\
 \\
 5x + 3(4) = 22 \\
 5x + 12 = 22 \\
 5x = 10 \\
 x = 2 \\
 \boxed{(2, 4)}
 \end{array}$$

$$\begin{array}{r}
 7. \quad 5x + 2y = 7 \quad 5 + 2 \\
 - \quad -2x + 2y = -14 \quad -14 \\
 \hline
 7x = 21 \\
 \frac{7x}{7} = \frac{21}{7} \\
 x = 3 \\
 \\
 5(3) + 2y = 7 \\
 15 + 2y = 7 \\
 -15 \quad -15 \\
 \hline
 2y = -8 \\
 y = -4 \\
 \boxed{(3, -4)}
 \end{array}$$

$$\begin{array}{r}
 8. \quad 3x - 9y = -12 \\
 - \quad -3x + 15y = +6 \\
 \hline
 6y = -6 \\
 y = -1 \\
 \\
 3x - 9(-1) = -12 \\
 3x + 9 = -12 \\
 -9 \quad -9 \\
 \hline
 3x = -21 \\
 x = -7 \\
 \boxed{(-7, -1)}
 \end{array}$$

$$\begin{array}{r}
 9. \quad -4c - 2d = -2 \\
 - \quad 2c + 2d = +14 \\
 \hline
 -6c = 12 \\
 c = -2 \\
 \\
 -4(-2) - 2d = -2 \\
 8 - 2d = -2 \\
 -8 \quad -8 \\
 \hline
 -2d = -10 \\
 d = 5 \\
 \boxed{(-2, 5)}
 \end{array}$$

$$\begin{aligned} 10. \quad & 2x + 6y = 6 \\ & 2x + 3y = 24 \end{aligned}$$

$$\begin{aligned} & \underline{9y = 18} \\ & y = 2 \\ 2x + 3(2) &= 24 \\ 2x + 6 &= 24 \\ 2x &= 18 \\ x &= 9 \end{aligned}$$

$$\boxed{(9, 2)}$$

$$\begin{aligned} 13. \quad & 2x + 4y = 10 \\ & x - 4y = -2.5 \end{aligned}$$

$$\begin{aligned} & \underline{3x = 7.5} \\ x &= 2.5 \end{aligned}$$

$$\begin{aligned} 2.5 - 4y &= -2.5 \\ -2.5 & \quad \quad -2.5 \\ \hline -4y &= -5 \\ -4 & \quad \quad -4 \\ \hline y &= 1.25 \end{aligned}$$

$$\boxed{(2.5, 1.25)}$$

$$16. \quad 4a = -b + 2$$

look alike

$$\begin{aligned} 4a + 3b &= 10 \\ -4a + b &= 2 \\ \hline 2b &= 8 \\ b &= 4 \\ 4a &= -4 + 2 \\ 4a &= -2 \\ a &= -0.5 \end{aligned}$$

$$\boxed{(-0.5, 4)}$$

$$\begin{aligned} 11. \quad & 7x + 2y = 2 \\ & 7x - 2y = -30 \end{aligned}$$

$$\begin{aligned} 14x &= -28 \\ x &= -2 \end{aligned}$$

$$\begin{aligned} 7(-2) + 2y &= 2 \\ -14 + 2y &= 2 \\ 2y &= 16 \end{aligned}$$

$$\begin{aligned} y &= 8 \\ \boxed{(-2, 8)} \end{aligned}$$

$$\begin{aligned} 14. \quad & 2.5x + y = 10.7 \\ & -2.5x + 2y = 12.9 \end{aligned}$$

$$\begin{aligned} -y &= -2.2 \\ y &= 2.2 \end{aligned}$$

$$\begin{aligned} 2.5x + 2.2 &= 10.7 \\ -2.2 \quad -2.2 \\ \hline 2.5x &= 8.5 \\ x &= 3.4 \end{aligned}$$

$$\boxed{(3.4, 2.2)}$$

$$\begin{aligned} 17. \quad & -\frac{1}{3}x - \frac{4}{3}y = -2 \\ + & \frac{1}{3}x - \frac{2}{3}y = 4 \end{aligned}$$

$$\begin{aligned} & -\frac{6}{3}y \\ & -2y = 2 \\ & y = -1 \end{aligned}$$

$$\begin{aligned} \frac{1}{3}x + \frac{2}{3} &= 4 \\ \frac{1}{3}x + \frac{2}{3} &= \frac{12}{3} \end{aligned}$$

$$\begin{aligned} \frac{1}{3}x &= \frac{10}{3} \\ x &= 10 \end{aligned}$$

$$\boxed{(10, -1)}$$

$$\begin{aligned} 12. \quad & 4.25x - 1.28y = -9.2 \\ & x + 1.28y = 17.6 \end{aligned}$$

$$\begin{aligned} 5.25x &= 8.4 \\ x &= 1.6 \end{aligned}$$

$$\begin{aligned} 1.6 + 1.28y &= 17.6 \\ 1.28y &= 16 \\ y &= 12.5 \end{aligned}$$

$$\boxed{(1.6, 12.5)}$$

$$15. \quad 6m - 8n = 3$$

$$2m = 8n + 3$$

$$-2m + 8n = +3$$

$$4m = 6$$

$$m = 1.5$$

$$2(1.5) = 8n + 3$$

$$\begin{aligned} 3 &= 8n + 3 \\ +3 & \quad \quad +3 \end{aligned}$$

$$\begin{aligned} 6 &= 8n \\ \frac{6}{8} &= \frac{8n}{8} \quad n = 0.75 \\ \boxed{(1.5, 0.75)} \end{aligned}$$

$$\begin{aligned} 18. \quad & \frac{3}{4}x - \frac{1}{2}y = 8 \\ + & \frac{3}{2}x + \frac{1}{2}y = 19 \end{aligned}$$

$$\frac{4}{4} \frac{3}{4}x = \frac{27.4}{4}$$

$$x = 12$$

$$\boxed{(12, 2)}$$

$$\frac{3}{4}(12) - \frac{1}{2}y = 8$$

$$\begin{aligned} 9 - \frac{1}{2}y &= 8 \\ -9 & \quad \quad -9 \end{aligned}$$

$$\begin{aligned} -\frac{1}{2}y &= -1 \\ y &= 2 \end{aligned}$$