

Solve each system of linear equations by elimination. List your answer as an ordered pair (x,y).

1.) $5x - 2y = 4 \rightarrow 5x - 2y = 4$
 $(3x + y = 9) \cdot 2 \rightarrow 6x + 2y = 18$

$$\begin{array}{r} 5x - 2y = 4 \\ 6x + 2y = 18 \\ \hline 11x = 22 \\ \hline x = 2 \end{array}$$

$x = 2$

$3(2) + y = 9$
 $6 + y = 9$
 $-6 \quad -6$
 $y = 3$

(2, 3)

2.) $(7x - 3y = -5) \cdot 2 \rightarrow 14x - 6y = -10$
 $(3x + 2y = 11) \cdot 3 \rightarrow 9x + 6y = 33$

$$\begin{array}{r} 14x - 6y = -10 \\ 9x + 6y = 33 \\ \hline 23x = 23 \\ \hline x = 1 \end{array}$$

$x = 1$

$3(1) + 2y = 11$
 $3 + 2y = 11$
 $-3 \quad -3$
 $2y = 8$
 $\frac{2y}{2} = \frac{8}{2}$
 $y = 4$

(1, 4)

Solve each system of linear equations by substitution. List your answer as an ordered pair (x,y).

3.) $5x + 6y = -11$
 $3x + y = -4 \rightarrow y = -3x - 4$

subst.

$$5x + 6(-3x - 4) = -11$$

$$5x - 18x - 24 = -11$$

$$-13x - 24 = -11$$

$$+24 \quad +24$$

$$\frac{-13x}{-13} = \frac{13}{-13}$$

$x = -1$

$y = -3(-1) - 4$
 $y = 3 - 4$
 $y = -1$

(-1, -1)

4.) $4x - 3y = -20$
 $-x - 8y = 5 \rightarrow -x = 8y + 5$
 $x = -8y - 5$

subst.

$$4(-8y - 5) - 3y = -20$$

$$-32y - 20 - 3y = -20$$

$$-35y - 20 = -20$$

$$+20 \quad +20$$

$$\frac{-35y}{-35} = \frac{0}{-35}$$

$y = 0$

$x = -8(0) - 5$
 $x = -5$

(-5, 0)

Solve each system of linear equations by elimination. List your answer as an ordered pair (x,y).

Hint: Eliminate y first!

5.) $x^2 + x - y = -1$
 $x + y = 4$

$$\begin{array}{r} x^2 + x - y = -1 \\ x + y = 4 \\ \hline x^2 + 2x = 3 \end{array}$$

$$x^2 + 2x = 3$$

$$x^2 + 2x - 3 = 0$$

AC METHOD

$$x^2 + 2x - 3 = 0$$

$$x^2 + 3x - 1x - 3 = 0$$

$$x(x+3) - 1(x+3) = 0$$

$$(x+3)(x-1) = 0$$

$$x+3=0 \quad x-1=0$$

$$x = -3$$

$$x = 1$$

$$(x, y) = (-3, 7)$$

$$(x, y) = (1, 3)$$

QUADRATIC FORMULA

$$x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(-3)}}{2(1)}$$

$$x = \frac{-2 \pm \sqrt{4+12}}{2}$$

$$x = \frac{-2 \pm \sqrt{16}}{2}$$

$$x = \frac{-2+4}{2} \quad x = \frac{-2-4}{2}$$

$$x = 1$$

$$x = -3$$

$$y = 3$$

$$y = 7$$

6.) $x^2 - 5x - y = 2$
 $x^2 + 2x + y = 0$

$$2x^2 - 3x = 2$$

$$2x^2 - 3x + 2 = 0$$

Hint: Eliminate y first!

AC METHOD

$$2x^2 - 3x + 2 = 0$$

$$2x^2 - 4x + 1x - 2 = 0$$

$$2x(x-2) + 1(x-2) = 0$$

$$(x-2)(2x+1) = 0$$

$$x-2=0 \quad 2x+1=0$$

$$x=2 \quad x=-\frac{1}{2}$$

$$y=-8 \quad y=\frac{3}{4}$$

QUADRATIC FORMULA

$$x = \frac{3 \pm \sqrt{(3)^2 - 4(2)(2)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{9+16}}{4}$$

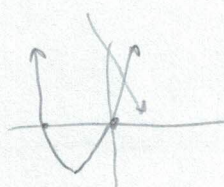
$$x = \frac{3 \pm \sqrt{25}}{4}$$

$$x = \frac{3+5}{4} \quad x = \frac{3-5}{4}$$

$$x=2 \quad x=-\frac{1}{2}$$

$$y=-8 \quad y=\frac{3}{4}$$

$$(2, -8) \quad (-\frac{1}{2}, \frac{3}{4})$$



Solve each system of linear equations by substitution. List your answer as an ordered pair (x,y).

7.) $y = -x^2 + 4$
 $y = -4x + 8$

$$\begin{array}{r} -x^2 + 4 = -4x + 8 \\ -x^2 + 4x - 4 = 0 \end{array}$$

$$x^2 - 4x + 4 = 0$$

AC METHOD

$$x^2 - 4x + 4 = 0$$

$$x^2 - 2x - 2x + 4 = 0$$

$$x(x-2) - 2(x-2) = 0$$

$$(x-2)(x-2) = 0$$

$$x-2=0$$

$$x=2$$

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

$$y=0$$

$$(2, 0)$$

QUADRATIC FORMULA

$$x = \frac{4 \pm \sqrt{(4)^2 - 4(1)(4)}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{16-16}}{2}$$

$$x = \frac{4 \pm 0}{2}$$

$$x = 2$$

$$y = 0$$

8.) $x^2 + 3x + y = 0$
 $2x + y = 5$

$$\begin{array}{r} y = -2x + 5 \\ x^2 + 3x + (-2x + 5) = 0 \end{array}$$

$$x^2 + 3x - 2x + 5 = 0$$

$$x^2 + x + 5 = 0$$

AC METHOD
DOES NOT FACTOR!

$$x = \frac{-1 \pm \sqrt{1^2 - 4(1)(5)}}{2(1)}$$

$$x = \frac{-1 \pm \sqrt{1-20}}{2}$$

$$x = \frac{-1 \pm \sqrt{-19}}{2} \leftarrow \text{IMAGINARY}$$

NO SOLUTIONS!!