

## Sec 5.1 Systems of Equations (2 variables)

Determine if  $(-3, 5)$  is a  
solution to

*yes*

$$\begin{aligned}9x + 7y &= 8 \\8x - 9y &= -69\end{aligned}$$

$$\begin{aligned}9(-3) + 7(5) &= 8? \\-27 + 35 &= 8? \quad \text{yes}\end{aligned}$$

$$\begin{aligned}8(-3) - 9(5) &= -69? \\-24 - 45 &= -69\end{aligned}$$

Solve using the substitution method-

$$x = 3y + 7$$

$$x = 2y - 1$$



$$3y + 7 = 2y - 1$$

$$x = -8$$

$$x = 2(-8) - 1$$
$$= -17 \quad (-17, -8)$$

$$2x - 3y = -13$$

$$y = 2x + 7$$

$$2x - 3(2x + 7) = -13$$

$$2x - 6x - 21 = -13$$

$$-4x = 8$$

$$x = -2$$

$$y = 2(-2) + 7$$
$$= 3 \quad (-2, 3)$$

Solve using the a combination-

same  
subtract

(aka, addition, subtraction,  
multiplication)

opposites  
add

$$-9x - 6y = 18$$

$$-(-9x + y = 18)$$

$$\hline -7y = 0$$

$$y = 0$$

$$\hline -9x = +18$$

$$x = -2$$

$$-x + 8y = 14$$

$$+ (x + 3y = -3)$$

$$\hline 11y = 11$$

$$y = 1$$

$$\hline -x + 8 = 14$$

$$-x = 6 \quad x = -6$$

Solve using the a combination-

$$\begin{array}{r} (3x - 7y = 13) \times 2 \rightarrow 6x - 14y = 26 \\ 6x + 5y = 7 \\ \hline \end{array}$$

$$-19y = 19$$

$$\leftarrow y = -1$$

POI (2, -1)

$$6x - 5 = 7$$

$$6x = 12$$

$$x = 2$$

determine the point of intersection-

$$6 \left( \frac{x}{6} - \frac{y}{2} = \frac{1}{3} \right) \rightarrow x - 3y = 2$$

$$x + 2y = -3 \quad - \quad (x + 2y = -3)$$

$$-5y = 5$$

$$x - 2 = -3$$

$$x = -1$$

$$y = -1$$

POI

$$(-1, -1)$$

You're solving a system...  
....all the variables cancel and  
a true statement  
(i.e.  $3 = 3$ ) remains...

infinitely many  
solutions

You're solving a system...  
....all the variables cancel and  
a false statement  
(i.e.  $0 = 2$ ) remains...

no solution  
 $\emptyset$

Suggested Practice

Section 5.1

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1,5,9,15,17

19,23,29,

31,33

## Solutions-

1. solution

5. (1,3)

9. (-22,-5)

15. (5,4)

17. (7,3)

19. (2,-1)

23. (-4,3)

29. (7/25,-1/25)

31. no solution

33. infinitely many  
solutions



