

5.2 Solving Systems of Equations by Substitution

Directions: Use substitution to solve each system of equations. Write your answer as an ordered pair. **SHOW ALL YOUR WORK!!!**

Example 1

Step One

$$\begin{aligned} x - 2y &= -3 \\ 4x - 3y &= 8 \end{aligned}$$

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"This one is easily solved for x!"

Step Two

$$x = 2y - 3$$

"We're identical twins! You can replace one of us with the other and you won't know the difference!"

$$\begin{aligned} 4x - 3y &= 8 \\ 4(2y - 3) - 3y &= 8 \end{aligned}$$

"It's twin sister swap!"

Step Three

Solve the equation with the substituted value...

$$4(2y - 3) - 3y = 8$$

Step Four

Take your answer and plug it any equation to find the last variable

Use $x - 2y = -3$ or $4x - 3y = 8$ or $x = 2y - 3$

"I think using the last one is always easiest!"

1. $y = 7x - 10$
 $y = -3$

2. $x = -8$
 $2x + y = -12$

3. $y = 6x$
 $y - 7 = 5x$

4. $y + 9 = 9x$
 $y = 9$

5. $x = -4$
 $y = -x - 8$

6. $y = 8x - 9$
 $y = 7$

$$\begin{aligned} 7. \quad x - 6y &= -14 \\ x &= -8y \end{aligned}$$

$$\begin{aligned} 8. \quad y &= 2x - 15 \\ y &= 5x \end{aligned}$$

$$\begin{aligned} 9. \quad y &= -8x \\ 2x + 4y &= 0 \end{aligned}$$

$$\begin{aligned} 10. \quad -4x + y &= 6 \\ -5x - y &= 21 \end{aligned}$$

$$\begin{aligned} 11. \quad -7x - 2y &= -13 \\ x - 2y &= 11 \end{aligned}$$

$$\begin{aligned} 12. \quad -3x + 3y &= 4 \\ -x + y &= 3 \end{aligned}$$

$$\begin{aligned} 13. \quad x &= 2y \\ 3x + 3y &= 18 \end{aligned}$$

$$\begin{aligned} 14. \quad 6x + 6y &= -6 \\ 5x + y &= -13 \end{aligned}$$

$$\begin{aligned} 15. \quad 3x - 4y &= 2 \\ 3x + 3y &= -3 \end{aligned}$$