

6.2 Solving a Linear System by Substitution:

We use this method when we have one variable by itself:

TYPE #1:

$$\begin{aligned} 5y &= 15 \\ 3x - y &= 0 \end{aligned}$$

$$\begin{aligned} \frac{5y}{5} &= \frac{15}{5} \\ y &= 3 \end{aligned}$$

$$\begin{aligned} 3x - 3 &= 0 \\ +3 \quad +3 \\ 3x &= 3 \\ x &= 1 \end{aligned}$$

$(1, 3)$

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2.

$$\begin{aligned} \frac{1}{4}y &= 2 \\ 4x + 2y &= 28 \end{aligned}$$

$$\frac{4}{1} \cdot \frac{1}{4}y = 2 \cdot \frac{4}{1}$$

$$y = 8$$

$$\begin{aligned} 4x + 2(8) &= 28 \\ 4x + 16 &= 28 \\ -16 \quad -16 \\ 4x &= 12 \\ x &= 3 \end{aligned}$$

$(3, 8)$

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TYPE #2:

3.

$$\begin{aligned} y &= 2x - 5 \\ y &= 3x + 1 \end{aligned}$$

$$\begin{aligned} 2x - 5 &= 3x + 1 \\ -3x \quad -3x \\ -x - 5 &= 1 \\ +5 \quad +5 \\ -x &= 6 \\ -1 \quad -1 \\ x &= -6 \end{aligned}$$

$$\begin{aligned} y &= 3(-6) + 1 \\ y &= -17 \end{aligned}$$

$(-6, -17)$

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4.

$$\begin{aligned} y &= 3x - 6 \\ 2x + y &= 4 \end{aligned}$$

$$\begin{aligned} 2x + 3x - 6 &= 4 \\ 5x - 6 &= 4 \\ +6 \quad +6 \\ 5x &= 10 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} y &= 3(2) - 6 \\ y &= 0 \end{aligned}$$

$(2, 0)$

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5.

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

$$\begin{aligned} -2y + 6 &= 3y + 1 \\ -3y \quad -3y \\ -5y + 6 &= 1 \\ -6 \quad -6 \\ -5y &= -5 \\ \frac{-5y}{-5} &= \frac{-5}{-5} \\ y &= 1 \end{aligned}$$

$$\begin{aligned} x &= 3(1) + 1 \\ x &= 4 \end{aligned}$$

$(4, 1)$

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6.

$$\begin{aligned} y &= x - 4 \\ 4x + y &= 36 \end{aligned}$$

$$\begin{aligned} 4x + x - 4 &= 36 \\ 5x - 4 &= 36 \\ +4 \quad +4 \\ 5x &= 40 \\ x &= 8 \end{aligned}$$

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

$(8, 4)$

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7. $2x + 3y = 31$
 $y = x + 7$

$$2x + 3(x+7) = 31$$

$$2x + 3x + 21 = 31$$

$$5x + 21 = 31$$

$$5x = 10$$

$$x = 2$$

$y = 2 + 7$
 $y = 9$

$(2, 9)$

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Multiple Choice.

Which ordered pair is a solution to $x - 2y = -6$ and $4x + 6y = 4$?

- a) (1, 0) b) (-6, 0) **c) (-2, 2)** d) (2, -2)

$$x - 2y = -6$$

$$4x + 6y = 4$$

$$4(2y - 6) + 6y = 4$$

$$8y - 24 + 6y = 4$$

$$14y - 24 = 4$$

$$14y = 28$$

$$y = 2$$

$$x = 2y - 6$$

$$x = 2(2) - 6$$

$$x = 4 - 6$$

$$x = -2$$

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Classwork: p.381 #3 - 10 all, 18

Final Five

Solve using substitution.

$$y = -3x - 8$$

$$y = -2x + 6$$

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