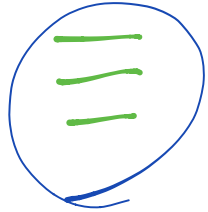


Please have your homework on your desk.

Today we will review solving systems of equations using elimination and substitution.

Homework: page 120: 13-35 odd, 39-41, 43, 44. Also begin work on the "math116" worksheet that is posted online. SUMMATIVE QUIZ FRIDAY. The review is already posted.

Progress Book -  
 CLASS Information  
to find HwD info

## Substitution

→ solve one equation for x or y and plug into other equation

$$\begin{cases} 1x + 2y = 8 \\ \frac{1}{2}x - 1y = 18 \end{cases}$$

$$\begin{array}{r} x + 2y = 8 \\ -2y \quad -2y \\ \hline \end{array}$$

$$x = 8 - 2y$$

$$\frac{1}{2}(8 - 2y) - 1y = 18$$

Solve equation.

$$4 - 1y - 1y = 18$$

$$\begin{array}{r} 4 - 2y = 18 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\begin{array}{r} -2y = 14 \\ y = -7 \end{array}$$

Plug back in to find  $x$ .

$$x = 8 - 2y$$

$$x = 8 - 2(-7)$$

$$x = 8 - -14$$

$$x = 22$$

Write answer as ordered pair  $(22, -7)$

ex. Solve by substitution.

$$4x + y = 5 \rightarrow \text{bc } y \text{ has a coefficient of 1.}$$

$$3x - 2y = 1$$

Solve  $4x + y = 5$  for  $y$ .

$$-4x$$

$$-4x$$

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$$y = 5 - 4x$$

$$\text{Plugin } 3x - 2(5 - 4x) = 1$$

$$3x - 10 + 8x = 1$$

$$\begin{array}{r} 11x - 10 = 1 \\ +10 \quad +10 \\ \hline \end{array}$$

$$11x = 11$$

$$x = 1$$

$$y = 5 - 4x$$

$$y = 5 - 4 \cdot 1$$

$$y = 5 - 4$$

$$y = 1$$

$$(1, 1)$$

## Elimination

$$\begin{array}{l} 2(3x - 7y = -14) \\ 7(5x + 2y = 45) \end{array}$$

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$$\begin{array}{r} 6x - 14y = -28 \\ 35x + 14y = 315 \end{array}$$

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$$41x = 287$$

$$x = 7$$

$$5x + 2y = 45$$

$$5 \cdot 7 + 2y = 45$$

$$35 + 2y = 45$$

$$\begin{array}{r} -35 \quad -35 \\ \hline \end{array}$$

$$2y = 10$$

$$y = 5$$

$$(7, 5)$$

Ex. Solve w/ elimination

$$\begin{array}{r} 10x - 9y = 15 \\ -2(5x - 4y = 10) \\ \hline \end{array}$$

$$\begin{array}{r} 10x - 9y = 15 \\ -10x + 8y = -20 \\ \hline \end{array}$$

$$\begin{array}{r} -1y = -5 \\ y = 5 \end{array}$$

$$5x - 4y = 10$$

$$5x - 4 \cdot 5 = 10$$

$$\begin{array}{r} 5x - 20 = 10 \\ +20 \quad +20 \end{array}$$

$$5x = 30$$

$$x = 6$$

$$(6, 5)$$

# Substitution

- get x or y by itself in either equation

Ex.  $2x + y = 11$   
 $6x - 2y = -2$

$\rightarrow 2x + y = 11$   
 $-2x$   $-2x$

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$$y = 11 - 2x$$

Plug this in to OTHER equation.

$$6x - 2y = -2$$

$$6x - 2(11 - 2x) = -2$$

Solve for x.

$$6x - 22 + 4x = -2$$

$$\begin{array}{r} 10x - 22 = -2 \\ +22 \quad +22 \\ \hline \end{array}$$

$$6x = 20$$
$$x = 2$$

Find y.  $y = 11 - 2x$

$$y = 11 - 2 \cdot 2$$
$$y = 11 - 4$$
$$y = 7$$

$$(2, 7)$$

Write answer  
as ordered pair.

Ex. Substitution

$$2x - 3y = 3$$

$$x + y = 14$$

$$\begin{array}{r} -x \qquad \qquad \qquad -x \\ \hline \end{array}$$

$$y = 14 - x$$

$$2x - 3(14 - x) = 3$$



$$2x - 42 + 3x = 3$$

$$\begin{array}{r} 5x - 42 = 3 \\ +42 \quad +42 \end{array}$$

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$$5x = 45$$

$$x = 9$$

$$y = 14 - x$$

$$y = 14 - 9$$

$$y = 5$$

$$(9, 5)$$

# Elimination

$$\begin{array}{r} 2(3x - 5y = 6) \\ -3(2x - 4y = 4) \end{array}$$

$$\begin{array}{r} 6x - 10y = 12 \\ -6x + 12y = -12 \end{array}$$

$$\begin{array}{r} 2y = 0 \\ \frac{2y}{2} = \frac{0}{2} \end{array}$$

$$y = 0$$

$$3x - 5y = 6$$

$$3x - 5 \cdot 0 = 6$$

$$3x = 6$$

$$x = 2$$

$$(2, 0)$$

$$\begin{array}{r} 2 \quad 3 \\ 4 \quad 6 \\ 6 \quad 9 \\ 8 \end{array}$$

$$\begin{array}{r} 4 \quad 5 \\ 8 \quad 10 \\ 12 \quad 15 \\ 16 \quad 20 \\ 20 \end{array}$$

Ex. Elimination:

$$\begin{array}{r} 10x - 9y = 15 \\ -2(5x - 4y = 10) \end{array}$$

unchanged

$$\begin{array}{r} 10x - 9y = 15 \\ -10x + 8y = -20 \end{array}$$

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$$\begin{array}{r} -1y = -5 \\ \hline -1 \quad -1 \end{array}$$

$$y = 5$$

$$10x - 9y = 15$$

$$10x - 9 \cdot 5 = 15$$

$$10x - 45 = 15$$

$$10x = 60$$

$$x = 6$$

$$(6, 5)$$