Warm Up

Solve by Substitution

d) $y = (x - 1)$ → $y = 5 - 1$

$y = 4$

$x - 5y = -15$

$x - 5(x - 1) = -15$

$x - 5x + 5 = -15$

$-4x + 5 = -15$

$-5 \quad -5$

$\frac{-4x}{-4} = \frac{-20}{-4}$

$x = 5$

$(5, 4)$

x, y

$5 - 5(4) = -15$

$5 - 20 = -15$

$-15 = -15$ ✓

∴ yes, (5,4) soln

Homework Questions?

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$x = y + 5$

$2x + 3y = 0$

$2(y + 5) + 3y = 0$

$2y + 10 + 3y = 0$

$5y + 10 = 0$

$-10 \quad -10$

$\frac{5y}{5} = \frac{-10}{5}$

$y = -2$

(0, 0)

7) $x+y=5$ → $(y+7)+y=5$

$x=y+7$ $y+7+y=5$

16) $x=y+3$

$-2x+y=-6$

(3,0)

x y

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

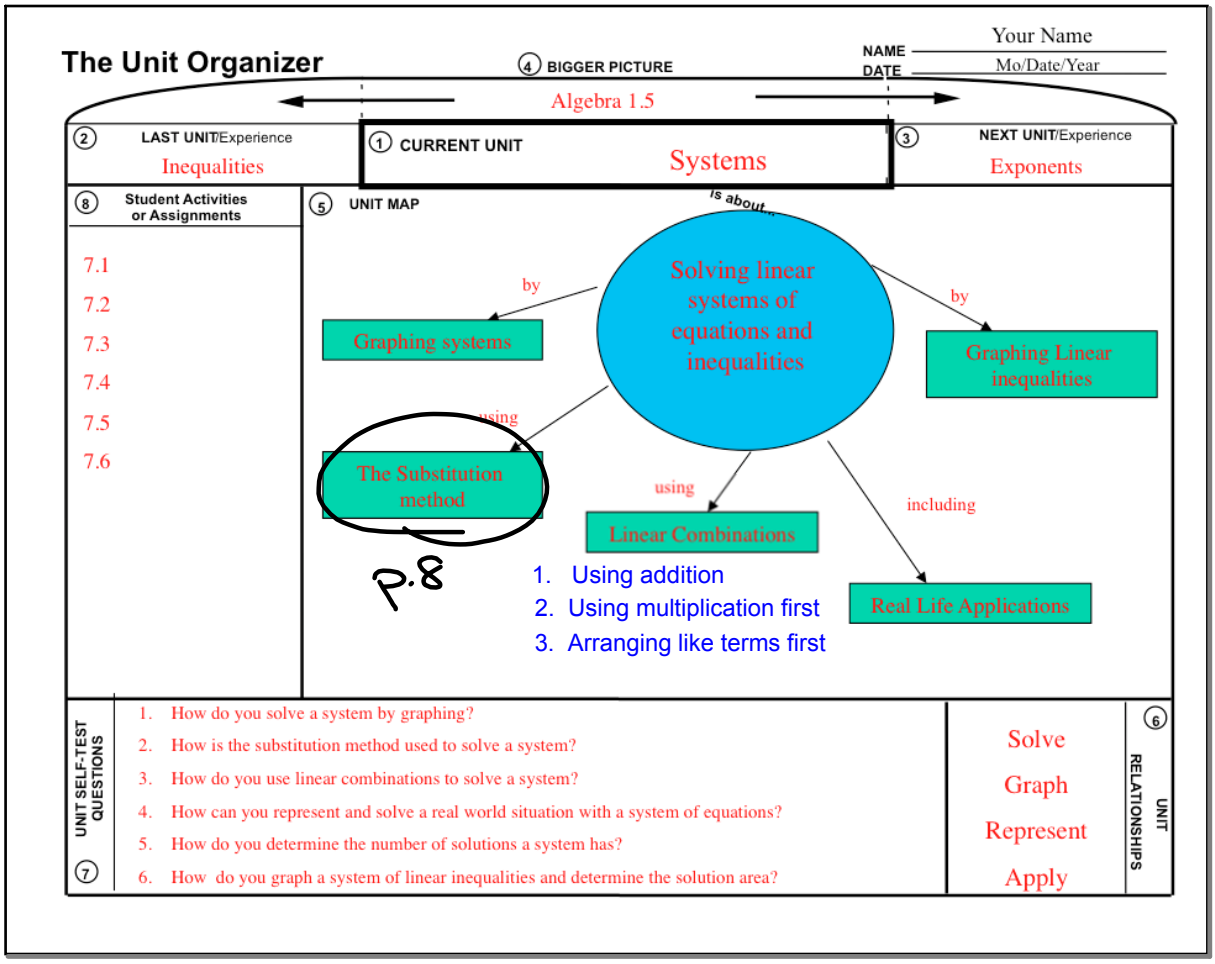
7.2 Solving Linear Systems by Substitution

Goals:
- Solve a linear system by substitution.

EQ: Which variable would be the easiest to solve for?

$7x + y = -3$

$4x - 2y = 10$



Example 1: Substitution Method – Solve for y First

Solve the linear system.

1) $2x - 3y = 3$
$-2x + y = -4$

$+2x \quad +2x$

$y = (2x - 4)$

$y = 2\left(\frac{9}{4}\right) - 4$

$y = \frac{9}{2} - \frac{8}{2}$

$y = 1/2$

$2x - 3(2x - 4) = 3$

$2x - 6x + 12 = 3$

$-4x + 12 = 3$

$-12 \quad -12$

$\frac{-4x}{-4} = \frac{-9}{-4}$

$x = \frac{9}{4}$

$\left(\frac{9}{4}, 1/2\right)$

$2\left(\frac{9}{4}\right) - 3\left(\frac{1}{2}\right) = 3$

$3 = 3 \checkmark$

$\therefore$ yes, $\left(\frac{9}{4}, \frac{1}{2}\right)$ soln

2) $3x + 2y = -2$
$6x - y = 6$

$-6x \quad -6x$

$\frac{-y}{-1} = \frac{-6x}{-1} + \frac{6}{-1}$

$y = 6x - 6$

Example 2: Substitution Method – Solve for x First

Solve the linear system.

3) $3x - 3y = 3$
$x + 3y = 9$
$-3y \quad -3y$

$x = (-3y + 9)$

$x = -3(2) + 9$
$x = -6 + 9$
$x = 3$

$(3, 2)$
x, y

$3(3) - 3(2) = 3$
$9 - 6 = 3$
$3 = 3$ ✓

$3(-3y + 9) - 3y = 3$
$-9y + 27 - 3y = 3$
$-12y + 27 = 3$
$-27 \quad -27$
$\frac{-12y}{-12} = \frac{-24}{-12}$
$y = 2$

yes, (3, 2) soln

4) $5x - y = -8$
$x + y = 2$
$-y \quad -y$

$x = -y + 2$

OR

$x + y = 2$
$-x \quad -x$

$y = -x + 2$

Try It Name the variable that you would solve for first. Explain.

a) $x - 2y = 0$
$x - 8y = -5$

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

b) $4x + 2y = 10$
$7x - y = 12$

$-7x \quad -7x$
$\frac{-y}{-1} = \frac{-7x}{-1} + \frac{12}{-1}$
$y = 7x - 12$

SUMMARY

EQ: Which variable would be the easiest to solve for?

$7x + y = -3$

$4x - 2y = 10$

1)

1) *Eqn w/ variable by itself
2) Plug in ( ) to working eqn
3) Solve for variable
4) Plug value into *Eqn
5) Solve for variable
6) (x,y) ✓ in working eqn

7.2 Homework

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