

Name: \_\_\_\_\_ Per: \_\_\_\_\_ Lesson SY – 3: Supplement

☠ Note: Give this supplement when the exercise below is about to begin. ☠



Objective: Solve Systems with Substitution

Homework SY3 – The Doctor’s Solving Systems with Substitution Fiesta

Do Now: Use substitution and simplify.

<u>Given</u> $a = 7$ $b = -10$ $c = 2x$ $d = x - 1$	1. $y = 3c + 5$	3. $bd = 20$
	2. $y = \frac{a+b}{c^2}$	4. $y = 4c + a$




Exam Prep: Which of the following is equal to  $2x + 4$  when  $x = y + 1$ ?

- A)  $3y + 6$     B)  $2y + 6$     C)  $3y + 5$     D)  $2y^2 + 6$

*A very special message from The Doctor...*

We will now solve systems using Algebra. The first way is by using the substitution method. Let’s discuss how we used substitution in the past?

Does this help? Explain what you see....


<u>Given</u>  = $4x + 8$  = $2x + 4$	<u>Pictogram Example</u>  = $2(\text{Dog icon})$	<u>Substitution</u> $4x + 8 = 2(2x + 4)$ $4x + 8 = 4x + 8$
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Solving Systems by Substitution

Both equations are equal to y.  Set them equal to each other and solve for x. This is the first part of the solution.  Solve for the y-value of the coordinate using normal substitution in either original equation.  Original System $y = -4x + 8$ $y = x - 12$	$y = -4x + 8$ $x - 12 = -4x + 8$ $+4x \quad +4x$ $5x - 12 = 8$ $+12 \quad +12$ $5x = 20$ $5 \quad 5$ $x = 4$	← Start with one equation ← Sub $x - 12$ for y ← Add $4x$ to both sides ← Add $12$ to both sides ← Divide both sides by $5$ ← x-value of solution
	----- $y = x - 12$ $y = 4 - 12$ $y = -8$ ----- Solution: $(4, -8)$	← Use any equation ← Sub your $4$ for x ← y-value of solution ----- ← Combine x and y parts



Practice: Show all work		
A) $y = x - 3$ $y = 2x$	B) $y = x + 4$ $y = 2$	C) $y = x - 6$ $y = 3x$

<p style="text-align: center;"><b>Substitution: Another View</b></p> <p style="text-align: center;">Replace <math>y</math> in one equation with the other and proceed.</p> <div style="text-align: center;">  </div>	$y = 3x + 8$ $8x + 4y = 12$ <hr style="border: 0.5px dashed black;"/> <p style="text-align: center;">Substituted</p> $8x + 4(3x + 8) = 12$	$8x + 12x + 32 = 12$ $20x + 32 = 12$ $\begin{array}{r} -32 \quad -32 \\ \hline 20x = -20 \\ 20 \quad 20 \\ \hline x = -1 \end{array}$
	<p style="text-align: center;">Find <math>x</math> and use any original equation.</p>	$y = 3x + 8$ $y = 3(-1) + 8$ $y = 5$ <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: right;"><u>Solution</u></div> <div><math>(-1, 5)</math></div> </div>

More Practice: Show all work			
A) $y = 2x$ $7x - y = 15$	B) $y = x$ $2x + y = 12$	C) $y = 2x + 1$ $3x + 4y = 26$	D) $2x + 5y = 44$ $y = 6x - 4$