



Objective: Solving 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

<p>Both equations are equal to y.</p> <p>Set them equal to each other and solve for x. This is the first part of the solution.</p> <p>Solve for the y-value of the coordinate using normal substitution in either original equation.</p> <p style="text-align: center;">Original System</p> <p style="text-align: center;">$y = -4x + 8$</p> <p style="text-align: center;">$y = x - 12$</p>	$y = -4x + 8$	← Start with one equation
	$x - 12 = -4x + 8$	← Sub $x - 12$ for y
	$+4x \quad +4x$	← Add 4x to both sides
	$5x - 12 = 8$	← Add 12 to both sides
	$+12 \quad +12$	← Divide both sides by 5
	$\frac{5x}{5} = \frac{20}{5}$	← x-value of solution
	$x = 4$	← Use any equation
	<hr style="border-top: 1px dashed black;"/> $y = x - 12$	← Sub your 4 for x
	$y = 4 - 12$	← y-value of solution
	$y = -8$	← Combine x and y parts
<hr style="border-top: 1px dashed black;"/> Solution: (4, -8)		

Practice: Show all work

A) $y = x - 3$ $y = 2x$	B) $y = x + 4$ $y = 2$	C) $y = x - 6$ $y = 3x$
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Substitution: Another View Replace y in one equation with the other and proceed. 	$y = 3x + 8$ $8x + 4y = 12$ <hr style="border-top: 1px dashed black;"/> Substituted $8x + 4(3x + 8) = 12$	$8x + 12x + 32 = 12$ $20x + 32 = 12$ $-32 \quad -32$ $\underline{20x} = \underline{-20}$ $20 \quad 20$ $x = -1$
	Find x and use any original equation.	$y = 3x + 8$ $y = 3(-1) + 8$ $y = 5$

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) $2x + 5y = 44$ $y = 6x - 4$