6) Linear Systems

46. What is the solution to the system of 2x = y + 3 and x + y = 3?

<mark>(1)</mark> (2,1)	(3) (3,0)
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(1) (2, 1) substitution $x + y = 3 \rightarrow y = 3 - x$ 2x = y + 3	x + y = 3 2 + y = 3 y = 1
2x = 3 - x + 3 2x = -x + 6 +x + x 3x = 6	Check 2(2) = 1 + 3 4 = 4
3 3 x = 2	2 + 1 = 3 3 = 3

47.	Which system of	equations has the	same solution se	t as the system below?
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2x + 2y = 16 3x - y = 4	$2x + 2y = 16 \qquad (1) 2x + 2y = 16 \rightarrow \text{ same as } 1^{\text{st}} \text{ equation}$ $3x - y = 4 \qquad 6x - 2y = 8 \rightarrow \text{ equivalent to } 2^{\text{nd}} \text{ equation}$ $(1) \text{Same equation as } 2x + 2y = 16$ $2(3x - y = 4) \text{ is } 6x - 2y = 8 \qquad \text{multiplication property of equality}$
(1) $2x + 2y = 16$	(2) Same as $2x + 2y = 16$
6x - 2y = 8	2(3x - y = 4) is not $6x - 2y = 4$
(2) $2x + 2y = 16$	(3) $2(x + y = 16) \frac{is not}{2x + 2y} = \frac{16}{2}$
6x - 2y = 4	Same as $3x - y = 4$
(3) $x + y = 16$	(4) $3(2x + 2y = 16)$ is $6x + 6y = 48$
3x - y = 4	2(3x - y = 4) is not $6x + 2y = 8$
(4) $6x + 6y = 48$ 6x + 2y = 8	This problem can also be solved by solving the given system and substituting the solution into each system pictured below.Solution to the system: $(3, 5)$ $2(3) + 2(5) = 16$ $6(3) - 2(5) = 8$ $6 + 10 = 16$ $18 - 10 = 8$ $16 = 16$ $8 = 8$

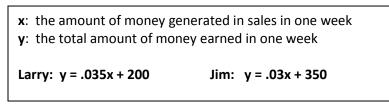
48. A student store sold a total of 55 shirts for \$620. The shirts sold were either red or white. If the red shirts sold for \$12 each and the white shirts sold for \$10 each, how many of each color were sold?

(1) 20 red and 35 white	w: # of white shirts soldr: # of red shirts sold	10w + 12r = 620 10w + 12(55 - w) = 10w + 660 - 12w =	
(2) 27 red and 28 white	$w + r = 55 \rightarrow r = 55 - w$ $10w + 12r = 620$	-2w + 660 = 620 -2w = -40	020
(3) 28 red and 27 white		w = 20	w + r = 55 20 + r = 55
(4) 35 red and 20 white	(4) 35 red and 20 white		r = 35

49. Diane delivers newspapers for \$5 a day plus \$0.04 per newspaper delivered. Jeremy delivers newspapers for \$2 a day plus \$0.10 per newspaper delivered. How many newspapers would Diane and Jeremy need to deliver in order to earn the same amount of money in one day?

 n: the number of newspapers delivered in one day T: total amount of money earned 	Check
	Diane Jeremy
Diane: T = .04n + 5 Jeremy: T = .10n + 2	T = .04(50) + 5 $T = .10(50) + 2$
	T = 2 + 5 T = 5 + 2
\$ Diane earns in one day = \$ Jeremy earns in one day	T = 7 T = 7
	\$7 \$7
T = T	
.04n + 5 = .10n + 2	
5 = .06n + 2	
3 = .06n	
50 = n Each person needs to deliver 50 newsp	apers.

- 50. Jim and Larry work at a furniture store. Larry earns \$200 per week plus 3.5% of his total sales in dollars, *x*. Jim is paid \$350 per week plus 3% of his total sales, *x*.
 - a) Write a system of equations that represents the weekly pay, y, of Larry and Jim based on total sales, x.



b) Determine the value of *x*, in dollars, that will make their weekly pay the same.

Larry: y = .035x + 200 Jim: y = .03x + 350	Check
\$ Larry earns in one week = \$ Jim earns in one week	Larry y = .035(30,000) + 200
y = y .035x + 200 = .03x + 350	y = 1250 \$1250
.005x + 200 = .05x + 350 .005x + 200 = 350	\$1250
.005x = 150	Jim
x = 30,000	y = .03(30,000) + 350
	y = 1250
	\$1250
Larry and Jim will earn the same amount of money if	
each one of them generates \$30,000 in sales.	

A check can also be done using the table of values on the calculator.