Name: Kelly

Date: 11/14/17

ALGEBRA 2 CC

TROICI

LESSON #2A: SYSTEMS OF EQUATIONS (WITH 3 VARIABLES) – DAY 1

1) Given the system below, determine the values of r, s, and u that satisfy all three equations.

$$r + 2s - u = 8$$
$$s + u = 4$$
$$r - s - u = 2$$

check:

$r + 2s - u = 8$

$-8 + 2(6) - (-2) = 8$

$8 = 8$ ✓

(1)

$r + 2s - u = 8$

$-1(r - s - u = 2)$

$\cancel{r} + 2s - \cancel{u} = 8$

$+\; -\cancel{r} - s + \cancel{u} = -2$

$s = 6$

(2) $s + u = 4$

$6 + u = 4$

$u = -2$

(3) $r + 2s - u = 8$

$r + 2(6) - (-2) = 8$

$r + 12 + 4 = 8$

$r + 16 = 8$

$r = -8$

STEPS FOR SOLVING LINEAR SYSTEMS WITH THREE VARIABLES

1. Identify ___system___ of equations (preferably ones with opposites).
2. Eliminate the same ___variable___ from both pairs.
3. ___solve___ the new system of two equations (using Elimination or Substitution)
4. ___substitute___ those values into one of the original equations to solve for the third variable.
5. ___Check___ your answer by plugging in all of your solutions into one of the original equations.

2) Determine the values for x, y, and z in the following system:

$$\begin{cases} 2x + 3y - z = 5 \\ 4x - y - z = -1 \\ x + 4y + z = 12 \end{cases}$$

① $2x + 3y - z = 5$
$-1(4x - y - z = -1)$

$2x + 3y - \cancel{z} = 5$
$+ -4x + y + \cancel{z} = 1$
$-2x + 4y = 6$

② $4x - y - \cancel{z} = -1$
$x + 4y + \cancel{z} = 12$
$5x + 3y = 11$

③ $5(-2x + 4y = 6)$
$2(5x + 3y = 11)$

$-\cancel{10x} + 20y = 30$
$\cancel{10x} + 6y = 22$
$26y = 52$
$y = 2$

$-2(\cancel{x}) + 4(2) = 6$
$-2x + 8 = 6$
$-2x = -2$
$\boxed{x = 1}$

④ $x + 4y + z = 12$
$(+1) + 4(2) + z = 12$
$+1 + 8 + z = 12$

$9 + z = 12$
$\boxed{z = 3}$

$\{x, y, z = 1, 2, 3\}$

CALCULATOR STEPS FOR SOLVING LINEAR SYSTEMS OF EQUATIONS

1) **2nd x^{-1} (matrix),** ←, edit, enter

2) Type in the # of rows by columns (usually 3 x 4)

3) Type in the coefficients. When there is no coefficient, be sure to enter in zero.

*4) 2nd quit (mode) to get to the home screen

5) **2nd x^{-1} (matrix)** → math, scroll to B: rref(

6) **2nd x^{-1} (matrix),** #1, A, enter

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LESSON #2A: EXIT TICKET

the following system, determine the values of p, q, and r that satisfy all three equations:

$2p + q - r = 8$

$q + r = 4$

$p - q \quad = 2$

$2p + q - r = 8$

$-2(p - q = 2)$

$2p + q - r = 8$

$-2p + 2q = -4$

$3q - r = 2$

$q + r = 4$

$+\,3q - r = 2$

$4q = 6$

$q = \frac{3}{2}$

$q + r = 4$

$\frac{3}{2} + r = 4$

$r = \frac{5}{2}$

$2p + q - r = 8$

$2p + \left(\frac{3}{2}\right) - \left(\frac{5}{2}\right) = 8$

$2p - 1 = 8$

$2p = 9$

$p = \frac{9}{2}$

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LESSON #2A: EXIT TICKET

For the following system, determine the values of p, q, and r that satisfy all three equations:

$2p + q - r = 8$

$q + r = 4$

$p - q \quad = 2$

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LAB #11

1) Solve the following system of equations algebraically: (Find your answers on the calculator 1st using matrix key.)

$2a + 4b + c = 5$

$a - 4b = -6$

$2b + c = 7$

$2a + 4b + c = 5$
$-1(2b + c = 7)$

$2a + 4b + \cancel{c} = 5$
$-2b - \cancel{c} = -7$
$2a + 2b = -2$

$2a + 2b = -2$
$-2(a - 4b = -6)$

$\cancel{2a} + 2b = -2$
$+ \cancel{-2a} + 8b = 12$
$10b = 10$
$b = 1$

$2a + 2(1) = -2$
$2a + 2 = -2$
$-2 \quad -2$
$2a = -4$
$a = -2$

$2a + 4b + c = 5$
$2(-2) + 4(1) + c = 5$
$\cancel{-4 + 4} + c = 5$
$c = 5$

check:
$2(-2) + 4(1) + 5 = 5$
$\cancel{-4 + 4} + 5 = 5$
$5 = 5$ ✓