Understanding Math

Concept: Solving Linear Systems

Name:

- **You should have completed Equations Outline A for Topic 6: Solving Linear Systems before beginning this handout.**

COMPUTER COMPONENT

Instructions: Select the computer program *Understanding Equations* (Neufeld)
Follow the instructions to the Main Menu.
Select *Solving Linear Systems* from the Main Menu.

*Notice: You will need to use the **Jump To** feature of the program (found on the top left of your screen) in order to get to the section where you left off.*

Work through all sections of this topic **in order**:

- *Solve a Linear System by Comparison*
- *Solve Problems Using Linear Systems*
- *Practice Questions*

As you work through the computer exercises, make your notes in the **NOTES** section of this page.

When you reach the end of the section *Practice Questions* on the computer, move on to the **OFF COMPUTER EXERCISES** below**.**

NOTES:

Solve a Linear System by Comparison (*Intersecting Lines*)

Step	Example
1. _____ one of the _____ for _____ equation. (*We choose y.*)	$2x - y + 3 = 0$ $x - y - 1 = 0$ $y =$ ___ $x +$ _____ (1) $y =$ ___ $x -$ _____ (2)

2. For the _____ , _____ of (1) = _____ of (2)	(1) (2) ____ x + _____ = ____ x - _____
3. Solve for _____ variable. *(_____ in this case)*	____ x + _____ = ____ x - _____ ____ x - ____ x = -_____ - _____ ____ x = _____ x = _____
4. Substitute x = _____ into one of the equations to solve for _____.	y = 3 x + 2 (1) y = 3 (_____) + 2 Common point is (_____, _____)

5.
_____ the solution in each _____ equation.
	2 x – y + 3 = 0 (1)
	x – y - 1 = 0 (2)
	For (1)
	L.S. = 2 x – y + 3
	= 2 (___) - (____) + 3
	= _____
	R.S. = 0 → Same then L.S. = R.S.
	For (2)

	L.S. = x – y - 1 = (___) - (____) - 1 = _____ R.S. = 0 ← Same then L.S. = R.S.

Solving a Linear System by Comparison (Intersecting Lines Involving Fractions)

- For each equation, _____ the _____ from the equation.

  (_____ *each term by a* _____

  _____.)

  Once we have _____ and _____ the bracket, you now have equations with which you can continue to solve using the above steps for solving a linear System by Comparison (Intersecting Lines).

Solving a Linear System by Comparison (Parallel Lines)

- Parallel lines do not intersect. Therefore _____ of (1) cannot _____ _____ of (2).

  It is _____ possible to solve for _____ (or for _____), and these types of Linear Systems have _____ _____.

Solving a Linear System by Comparison (Coincidental Lines)

- Coincidental Lines are IDENTICAL. _____ points on line _____ are also on line _____. This Linear System has an _____ number of _____.

OFF COMPUTER EXERCISES

1. Solve the following linear systems by comparison.

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

(b) $x + y - 4 = 0$
$2x + y + 1 = 0$

(c) $5x + 2y - 8 = 0$
$2x + 4y + 8 = 0$

(d) $3x + 2y - 5 = 0$
$4x + 3y - 2 = 0$

2. The local fair charges $6.00 for admission, plus $0.50 for every ride ticket you buy. The neighboring town's fair offers free admission, but charges $1.00 for every ride ticket. *When is the local fair the better deal?*

3. The cost to rent a car with Company A is $25 per day plus $0.15 per km driven.
   The cost to rent a car with Company B is $30 per day plus $0.10 per km driven.
   Under what circumstances is Company A the better company to rent with?

4. The cost to rent a movie at Video Plus is $2.00 for the first night plus $0.50 for every night after that. The cost to rent a movie at Videos-R-Us is $6.00 for 7 nights. *When is Videos-R-Us the better deal?*

5. Which method would you choose to solve the given system of equations? Why? *Justify your answer and then solve it.*

$6x + 4y = 23$ (1)

$6x + 14y = 10$ (2)

6. A teacher hands out a math test to 36 students. The total marks for the test is 100 and it has 38 problems. The questions are worth either 5 marks or 2 marks. *How many questions of each type of mark are on the test? Justify your answer.*