

Date:

Title:

(A) **Lesson Objectives:**

- Algebraically, using elimination, determine the intersection point of two lines and verify the intersection point.
- Apply Linear Systems through real world applications
- Understand that linear systems can have no solutions, a unique solution, or infinite solutions

(B) **Opening Investigation:**

A linear system is defined by these two given equations →	$x + y = 8$
Create a new equation by vertically adding the like terms of the two equations. What happens to the x term?	$x - y = 2$
Now solve the new equation for x.	
Now create a new equation by vertically subtracting the like terms of the two equations. What happens to the x term?	$x + y = 8$ $x - y = 2$
Now solve the new equation for y.	
Summarize your findings.	

A linear system is defined by these two given equations →	$x + y = 4$
Create a new equation by vertically adding the like terms of the two equations. Has a variable been eliminated?	$x - 2y = 1$
Now create a new equation by vertically subtracting the like terms of the two equations. Has a variable been eliminated?	$x + y = 4$ $x - 2y = 1$
Now solve the new equation for y.	
Summarize your findings.	

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A linear system is defined by these two given equations →	$2x + y = 3$
Create a new equation by vertically adding the like terms of the two equations. Has a variable been eliminated?	$3x + 2y = 5$
Now create a new equation by vertically subtracting the like terms of the two equations. Has a variable been eliminated?	$2x + y = 3$ $3x + 2y = 5$
Can you now solve the new equation for either variable?	
Graph the line $2x + y = 3$ and then graph the line $4x + 2y = 6$. What do you notice?	
Now create a new equation system by doubling the first equation. WHY DID I DO THAT??? Will you vertically ADD or SUBTRACT the like terms of the two equations? Has a variable been eliminated?	$2(2x + y = 3) \rightarrow 4x + 2y = 6$ $3x + 2y = 5 \rightarrow 3x + 2y = 5$
Solve and verify the system	$4x + 2y = 6$ $3x + 2y = 5$
Summarize your findings.	

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(C) **Further Examples for Classwork** → Solve and verify the following linear systems:

$$\begin{aligned}3x + 2y - 13 &= 0 \\ -2x + 4y - 2 &= 0\end{aligned}$$

$$\begin{aligned}3x - 2y &= 2 \\ -10x + 3y &= 8\end{aligned}$$

$$\begin{aligned}4x &= 3 - y \\ 3y - 6x &= 9\end{aligned}$$

$$\begin{aligned}2y + 4 &= 6x \\ y - 3x &= 1\end{aligned}$$

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(D) Georgia is training for the upcoming track & field season. She needs to design a daily 45 minute workout using a combination of a stationary bike and a treadmill. To be in top shape, she should burn 400 calories in her workout. On a bike, she burns 8 cal/min and on the treadmill she burns 10 cal/min. How many minutes should she train on each piece of equipment?

(E) As the owner of a banquet hall, you are in charge of catering a reception. There are 2 dinners: a chicken dish that costs \$16 and a beef dish that costs \$18. The 300 wedding guests have ordered the dinners in advance and the total cost to prepare the dinners is \$5256. How many of each type of dinner are you preparing?

(F) **Homework/Resources**

- HOMEWORK: from the Nelson Textbook: S1.9, p101-104, Q2adf,3adf,4,6acegik,7,8
- Help from OnlineMathLearning with elimination → <http://www.onlinemathlearning.com/systems-of-linear-equations-2.html>