**Unit 4: Systems**

**Lesson 3: Solving Linear systems algebraically by Elimination**

Objectives:

* I can solve a system of two linear equations algebraically by Elimination.
* I can solve word problems involving systems using Elimination

Agenda:

* Video 4-3:
* Practice
* Applications

Vocabulary:

* System of equations, solving Algebraically, Elimination.

Focus Questions:

1. What does it mean to solve a system algebraically by Elimination?
2. How can we solve word problems involving numbers using systems?

Web support:

* <https://www.youtube.com/watch?v=FHSLKmyyxHA>
* <https://www.youtube.com/watch?v=8kRG7jlBMAY>
* <https://www.youtube.com/watch?v=tphSgpilNv8>
* <https://www.youtube.com/watch?v=65HCgk-fCTU>

Web Practice:

* <https://www.ixl.com/math/algebra-1/solve-a-system-of-equations-using-elimination>
* <https://www.khanacademy.org/math/algebra-basics/alg-basics-systems-of-equations/alg-basics-elimination-method-systems/e/systems_of_equations_with_elimination_0.5>
* <https://www.khanacademy.org/math/algebra-basics/alg-basics-systems-of-equations/alg-basics-elimination-method-systems/e/systems_of_equations_with_elimination>
* <http://www.mathgames.com/skill/8.54-solve-a-system-of-equations-using-elimination>
* <https://www.ixl.com/math/algebra-1/solve-a-system-of-equations-using-elimination-word-problems>

Homework: 4-3 finish your word problems

**Solve the following systems by elimination:**

1. ***Y+2x=5 2. 2x+y = -1***

 ***-y+4x= 1 -2x+y= -5***

**In the following examples we don’t have inverse variables. Think about what you need to multiply one of the equations by to create inverses**

1. ***-10x+2y=-6 4. -3x+3y=-3***

 ***-9x+2y=-5 -6x+3y=6***

1. ***2x+2y=16 6. -2x+ y=-6***

 ***3x-y=4 6x+5y=2***

1. **Mr. Hansen is buying donut and bagels for his colleagues and work. Each donut cost $0.5 and each Bagel cost $1. If he needs to buy 26 donuts and bagels and he wants to spend $20**
2. **Write two equations where x is the number of donuts and y is the number of bagels to represent this scenario.**

**b. Find algebraically the number of donuts and bagels that he needs to buy by elimination.**

1. **New Paltz Cinemas has two movie deals going on this year. The Fun Movie Deal offers movie tickets at $6 each plus an $18 membership fee. The Weekend movie Deal offers movie tickets at $2 each plus a $30 membership fee. At the current prices to see a movie, you want to take advantage of one of these deals.**
2. **Write an equation to represent each movies deal where x represents the number of tickets and y represent the cost in dollars.**

**Fun Movie: Weekend movie:**

1. **If you get the Fun Movie Deal, and your best friend gets the Weekend Movie Deal, how many movies do you have to see for the price to come out the same? Solve the system algebraically this time by Elimination**
2. **4y+8x=20 10. X+y=10**

 **2y-8x=-2 y=-5**

1. **Isaac earns $15 per hour working as a lifeguard at his neighborhood pool. He also coaches a baseball team for $10 per hour. Isaac needs to earn $275 per week, but he wants to work 25 hours per week.**
2. **Define the variables and write a system of linear equations to represent the situation.**
3. **Find the number of hours that he needs to work as a life guard and as a coach by elimination**
4. **Two cell phone plans offer differing text packages. The two plans are outlined below: Plan A: $5.00 per month charge along with a charge of $0.06 per text.**

**Plan B: No per month charge, but a charge of $0.10 per text.**

**Assume the cost is presented by y and the number of texts is represent by x. Find the number of texts, when the two plans cost the same amount by elimination.**

1. **2x+3y=8 14. 4x+3y=27**

 **2x+y=4 -2x+y=-1**

1. **At a wedding, there are 456 people spread out amongst 45 tables. There are no empty seats. The reception hall has tables that sit 12 people or 8 people. Last class you choose this system to represent this scenario**

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**Solve the system of equations to find the number of each type of table the restaurant has by elimination.**

1. **The Kurzy cable company has a monthly initial fee of $32.00 and an additional charge of $8.00 for each premium channel. The Russ Cable Company has a monthly initial fee of $26.00 and an additional charge of $10.00 for each premium channel. The Thompkins family is deciding which of these 2 companies to subscribe to. If x is the number of premium channels and y is the monthly subscription fee at the end of the month**
2. **Write an equation describing each cable company.**

**The Kurzie Cable Company: The Russ Cable Company:**

1. **For what number of premium channels will the total monthly subscription fee for both companies be the same algebraically by elimination?**

**Extra**

**Solve the following system of equations algebraically by Elimination:**

1.

1. Harold had a summer lemonade stand where he sold small cups of lemonade for $1.25 and large cups for $2.50. If Harold sold a total of 155 cups of lemonade and collected a total of $265. Define the variables and find the number of cups of each type he sold by elimination.
2. Elaina spent $3.60 for stamps to mail packages. Some were 30¢ stamps and the rest were 20¢ stamps. The number of 20¢ stamps was 2 less than the number of 30¢ stamps. Define the variables and find the numbers of each kind stamp Elaina bought.
3. You and your friends are planning a 7 day trip to Florida. You estimate it will cost $275 per day in Tampa and $400 a day in Orlando. Your total budget for the 7 days is $2300. Assume that the number of days that you will spend in Tampa is x and the number of days that you will spend in Orlando is y. write a system of equations and find out the number of **days you should spend in each location based on the constraints?**
4. Tyler and Finn went to an office supply store together. Tyler bought 15 boxes of paper clips and 3 packages of index cards for a total cost of $22.50. Finn bought 12 boxes of paper clips and 10 packages of index cards for a total cost of $37.00. Define the variables and find the cost of one box of paper clips and the cost of one package of index cards.

**Challenge Yourself:**

1. Janelle and Maddi are taking a test in their history class. Janelle started after Maddi had already finished 12 questions. Janelle answers questions at a rate of two per minute, while Maddie answers them at a rate of 5 questions every 4 minutes. Jenelle eventually catches up to maddi. How many minutes does it take her and what question are they on when janelle catches up?

**Solve the following systems by Any method algebraically**

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Regent Questions:

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Mathematician:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Quiz 6



1. Solve the system using substitution.

 

 

1. The sum of two numbers is 15 and their differences is 1. What is the larger number? Assume that 1st number is x and 2nd number is y. Solve the system algebraically.

Solve the system graphically on the back and get 2 bonus points



