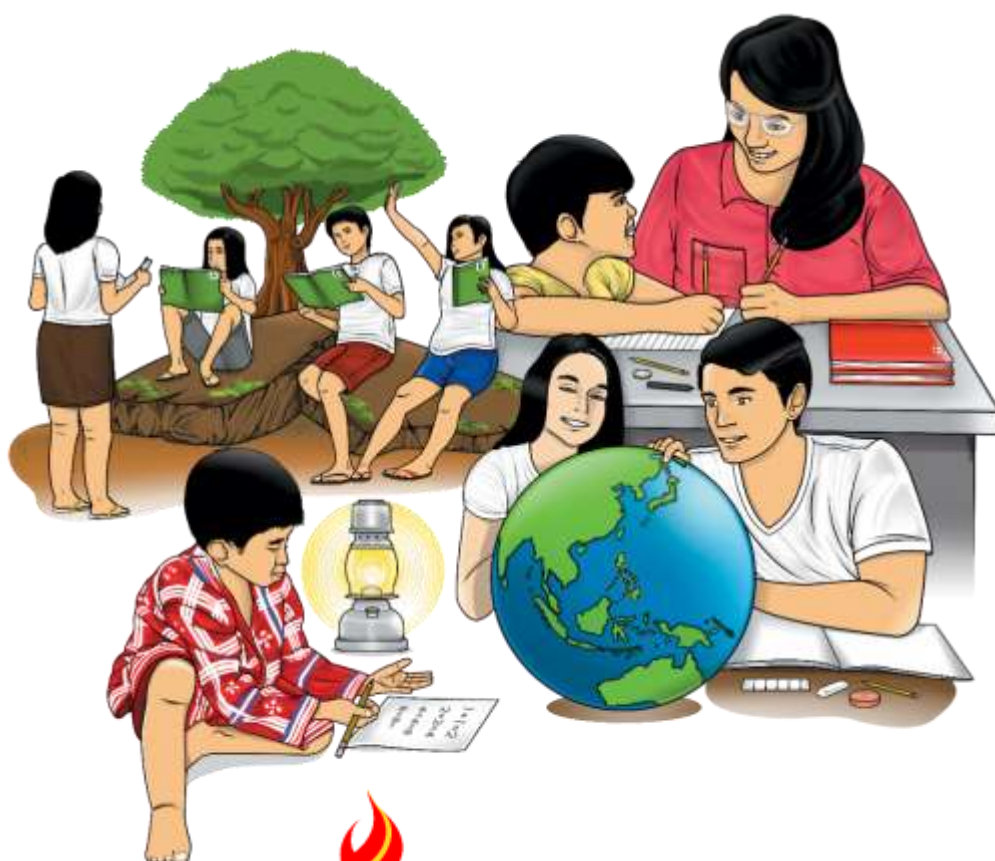


Mathematics

Quarter 1 – Module 13

Solving Problems Involving Linear Equations in Two Variables



Mathematics – Grade 8
Alternative Delivery Mode
Quarter 1 – Module 13 Solving Problems Involving Linear Equation in Two Variables
First Edition, 2020

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Published by the Department of Education
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Undersecretary: Diosdado M. San Antonio

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Printed in the Philippines by _____

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Mathematics

Quarter 1 – Module 13

**Solving Problems Involving Linear
Equations in Two Variables**

Introductory Message

For the facilitator:

Welcome to the Mathematics 8 Alternative Delivery Mode (ADM) Module on Solving Problems Involving Linear Equations in Two Variables!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:



Notes to the Teacher

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator, you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Mathematics 8 Alternative Delivery Mode (ADM) Module on Solving Problems Involving Linear Equations in Two Variables!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:



What I Need to Know

This will give you an idea of the skills or competencies you are expected to learn in the module.



What I Know

This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module.



What's In

This is a brief drill or review to help you link the current lesson with the previous one.



What's New

In this portion, the new lesson will be introduced to you in various ways; a story, a song, a poem, a problem opener, an activity or a situation.



What is It

This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.



What's More

This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.



What I Have Learned

This includes questions or blank sentence/paragraph to be filled in to process what you learned from the lesson.



What I Can Do

This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.



Assessment

This is a task which aims to evaluate your level of mastery in achieving the learning competency.



Additional Activities

In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned.



Answer Key

This contains answers to all activities in the module.

At the end of this module you will also find:

References

This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!



What I Need to Know

This module was designed and written with you in mind. It is here to help you master on how to solve problems involving linear equations in two variables. The scope of this module permits it to be used in many different learning situations. The language and numeric used recognizes the diverse vocabulary and numeracy level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

This module contains:

Lesson 1- Solving Problems involving Linear Equation in Two Variables

After going through this module, you are expected to:

1. translate word problems into linear equations;
2. solve problems involving linear equations in two variables;
and
3. apply the concepts of solving linear equations in dealing with real-life problems.



What I Know

Directions: Read the questions carefully and choose the letter of your BEST answer. Write the chosen letter on a separate sheet of paper.

1. Which of the statements below translates the mathematical equation " $4x + 5 = 21$ "?
 - A. Four x plus five with twenty-one.
 - B. Four x a number increased by five is twenty-one.
 - C. Four times a number increased by five is twenty-one.
 - D. Four times a number diminished by five gives twenty-one.
2. A square plywood platform has a perimeter which is 9 times the length of a side, decreased by 35. Find the length of a side.
 - A. 1
 - B. 5
 - C. 7
 - D. 12
3. Lucas has a job mowing lawns in his neighborhood, and gets paid ₱25 per hour. Identify the independent variable in computing his total pay.
 - A. The job
 - B. The lawn mowing
 - C. The total pay
 - D. The number of hours worked
4. You want to buy a hamburger and a mango pie. The hamburger costs ₱25 each and mango pie at ₱12 each. You have ₱160 to spend. If x is the number of hamburger and y is the number of mango pie, write an equation that models the different amount.
 - A. $25x + 12y = 160$
 - B. $12x + 25y = 160$
 - C. $12x + 160 = 25y$
 - D. $25x - 12y = 160$
5. Jonathan is six years older than Joshua. The sum of their ages is 48. Find Joshua's and Jonathan's age. What are the steps in solving Joshua and Jonathan's age in chronological order?
 - I. Translate the problem into an equation, diagram or chart.
 - II. Understand the problem. List all the components and data that are involve.
 - III. Check to see if the information is used correctly and that the answer make sense.
 - IV. Solve the equations you translated based on the given problem.
 - A. I, II, III, IV
 - B. II, IV, I, III
 - C. II, I, III, IV
 - D. II, I, IV, III
6. Refer to problem no. 5, what mathematical equation is needed to find Joshua's age?
 - A. $x + 6 = 48$
 - B. $x + x + 6 = 48$
 - C. $2x + x = 48$
 - D. $x + x = 48$

7. Still refer to problem no. 5, what is Jonathan's age?
- | | |
|-----------------|-----------------|
| A. 21 years old | C. 25 years old |
| B. 23 years old | D. 27 years old |

For items 8– 10, refer to the situation below:

Mang Kardo earns Php400 per day and additional Php100 for every hour overtime as technician.

8. What equation shall best represent the earnings of Mang Kardo when he rendered overtime services as a technician?
- | | |
|---------------------|---------------------|
| A. $y = x + 400$ | C. $y = 400x + 100$ |
| B. $y = 2(x + 400)$ | D. $y = 100x + 400$ |
9. What is the amount earned by Mang Kardo when he rendered 3 hours of overtime?
- | | |
|--------|--------|
| A. 400 | C. 600 |
| B. 500 | D. 700 |
10. If the equation in item 8 represents the amount paid for the labor in repairing computer units for every x number of hours, how much will Mang Kardo earn after 6 hours?
- | | |
|----------|------------|
| A. ₱ 800 | C. ₱ 1,000 |
| B. ₱ 900 | D. ₱ 1,100 |
11. Diane is a working student. She works in a restaurant and paid a minimum of Php350.00 for a 6-hour service rendered plus P50.00 per additional hour of service. What equation will represent the total amount of payment to Diane?
- | | |
|--------------------------|--------------------------|
| A. $y = 350x + 50$ | C. $y = 50(x + 6) + 350$ |
| B. $y = 50(x - 6) + 350$ | D. $y = 50(6x) + 350$ |
12. A t-shirt company charges P250.00 per order plus P99.00 per t-shirt. How much will it cost if you order 5 t-shirts?
- | | |
|----------|----------|
| A. ₱ 499 | C. ₱ 649 |
| B. ₱ 545 | D. ₱ 745 |
13. A cell phone repairman charges P150 for a repair service, plus 50 for each hour of work. How much will the repairman charge if he works for 5 hours?
- | | |
|----------|----------|
| A. ₱ 400 | C. ₱ 550 |
| B. ₱ 450 | D. ₱ 600 |
14. A multicab passenger is charged P10.00 for the first 4 km and an addition P2.00 per succeeding kilometer as fare. What is the cost of a 28-km ride?
- | |
|---------|
| A. ₱ 46 |
| B. ₱ 56 |
| C. ₱ 58 |
| D. ₱ 66 |

15. Refer to problem 14, how many succeeding kilometers did the passenger ride after he paid an amount of P34.00?

- A. $10 - km$
- B. $11 - km$
- C. $12 - km$
- D. $13 - km$

Lesson

1

Solving Problems involving Linear Equation in Two Variables



What's In!

Write the Correct Equation!

Directions: Translate the following verbal statements into mathematical equations. Write your answer on a separate sheet of paper. Let x represents a number.

- _____ 1. Twice a number is 6.
- _____ 2. Four added a number gives ten.
- _____ 3. If thrice a number is added to seven. The sum is ninety-eight.
- _____ 4. Twenty-five decreased by twice a number is twelve.
- _____ 5. The sum of a number x and 3 yields 25.
- _____ 6. The difference between thrice a number and nine is 100.

Questions:

- 1. What are the common terms used to represent the “=” sign?
- 2. Use the phrases “is equal to” in your own sentence.
- 3. What symbol/s represent the word “sum”, What about “difference”?
- 4. Is there any difficulty/ies in translating verbal statement into mathematical equations?



What's New!

Activity: Let's Play!

Jake is playing his favorite mobile game. The objective of the game is for the player to earn a specific number of stars to progress to the next higher level. Jake has already earned 300 stars and he can earn 100 stars for every hour of playing the game.

Guide Questions:

1. What are the given information?
2. What is asked?
3. What linear equation can be formulated to represent the total number of stars earned in a game?
4. How many stars will Jake have earned after playing for 4 hours? 5 hours? 6 hours?
5. Will it be good to play mobile games for a long period of time? Elaborate your answer.



What is It!

Applications of Linear Equation in Two Variables

Let us recall that a **solution of an equation in two variables** x and y is any ordered pair (x, y) that makes the equation true. To determine whether an ordered pair (x, y) is a solution of an equation, we will just substitute the values of x and y into the equation. On the other hand, equations in two variables usually have infinitely many solutions.

The processes of solving an equation discussed in the previous modules are very much helpful in solving problems involving linear equations in two variables. Translating verbal sentences into mathematical equations are also useful in this module.

There are many real-life situations that exhibit linear equation in two variables. Below are the steps to solve problems involving linear equations in two variables:

- First, read and understand the problem
- Second, translate the problem into an equation in two variables
- Third, find the solution using the formulated equation
- Fourth, check the solution obtained by substituting the solution/s to the original equations

To model these steps, let us recall Jake's number of stars earned per hour of playing a mobile game.

Step 1. Understand the problem.

Given:

- Jake has 300 stars
- Jake can earn 100 stars for every hour of playing the game

Asked: The total number of stars Jake can earn after playing for x hours

Let x be the number of hours spent in playing a mobile game

Let y be the total number of stars earned in playing the mobile game

Step 2. Translate the problem into an equation in two variables.

Using the information above, we can construct a table:

Number of hours spent (x)	1	2	3
Number of stars earned (y)	$100(1) + 300$	$300 + 100(2)$	$300 + 100(3)$



Number of hours spent (x)	1	2	3
Number of stars earned (y)	400	500	600

Hence, the situation can be modelled as $y = 100x + 300$

Step 3. Find the solution using the formulated equation.

To determine the number of stars earned after playing the game in 4 hours, use the equation obtained in Step 2 and substitute the value of x :

$$y = 100x + 300$$

$$y = 100(4) + 300 \quad \text{Substitute } x \text{ by } 4$$

$$y = 400 + 300$$

$$y = \mathbf{700}$$

The number of stars earned after 5 hours of playing will be:

$$y = 100x + 300$$

$$y = 100(5) + 300 \quad \text{Substitute } x \text{ by } 5$$

$$y = 500 + 300$$

$$y = 800$$

The number of stars earned after 6 hours of playing will be:

$$y = 100x + 300$$

$$y = 100(6) + 300 \quad \text{Substitute } x \text{ by } 6$$

$$y = 600 + 300$$

$$y = 900$$

Step 4. Check the solution obtained by substituting the solution/s to the original equations.

$x = 4, y = 700$	$x = 5, y = 800$	$x = 6, y = 900$
$y = 100x + 300$	$y = 100x + 300$	$y = 100x + 300$
$700 = 100(4) + 300$	$800 = 100(5) + 300$	$900 = 100(6) + 300$
$700 = 400 + 300$	$800 = 500 + 300$	$900 = 600 + 300$
$700 = 700$	$800 = 800$	$900 = 900$

Hence, the number of stars earned after playing the mobile game for 4, 5, and 6 hours is 700 stars, 800 stars, and 900 stars, respectively.

To have a deeper understanding on solving problems involving systems of linear equations in two variables, let's try to explore illustrative examples presented below.

Example 1:

A dress maker charges Php750.00 for sewing a seat cover with a minimum of 20 pieces, plus Php100.00 per seat cover cloth. How much will it cost if you will order 20 seat covers?

Step 1.

Let x = number of seat covers made

Let y = total amount to be paid for seat cover plus the charges

Step 2: $y = 20x + 750$

Step 3. Use the equation obtained in step 2 to solve the problem. Since the number of seat cover to be made is 20,

$$\begin{aligned}
 y &= 100x + 750 && \text{Substitute } x \text{ in the equation by } 20 \\
 y &= 100(20) + 750 \\
 y &= 2,000 + 750 \\
 y &= 2,750
 \end{aligned}$$

Step 4: Check answers directly against the facts of the problems. Substitute the value of x and y to the equation

$$\begin{aligned}
 y &= 100x + 750 \\
 2,750 &= 100(20) + 750 \\
 2,750 &= 2,000 + 750 \\
 2,750 &= 2,750
 \end{aligned}$$

Therefore, the total amount to be paid is Php2,750.00

Example 2:

A tricycle passenger is charged Php20.00 for the first ten kilometers and an additional of Php3.00 per succeeding kilometers. What is the cost of a 25-kilometer ride?

Step 1.

Let x = charge per succeeding kilometers

Let y = total cost

Step 2: In this problem we will use the table of values to find what is ask.

kilometers (x)	10	11	12	13
total cost (y)	20	23	26	29

To formulate the equation using the table of values, we can choose any two points in the form (x, y) , from the table to find the slope:

For example, let us choose $(10, 20)$ and $(11, 23)$.

$$\begin{array}{ccc}
 \downarrow & \downarrow & \downarrow \\
 x_1, y_1 & & x_2, y_2
 \end{array}$$

Use the slope formula. Substitute $(10, 20)$ for (x_1, y_1) and $(11, 23)$ for (x_2, y_2)

$$(\text{Slope}) m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{23 - 20}{11 - 10}$$

$$m = \frac{3}{1}$$

$$m = 3 \Rightarrow \text{slope}$$

To find the y-intercept, we can use the slope and any point from the table. Using the slope-intercept form equation of a line: $y = mx + b$

Substitute $m = 3$, and $(x, y) = (10, 20)$

$$y = mx + b$$

$$20 = 3(10) + b$$

$$20 = 30 + b$$

$$-10 = b \quad \Rightarrow \text{y-intercept}$$

Substitute the slope and the y-intercept obtained to the equation $y = mx + b$. Therefore, using the table above, we come up with the equation

$$y = 3x - 10$$

Step 3: Use the equation obtained in step 2 to solve the problem. Since you were ask for a total cost of a 25 km ride,

$$y = 3x - 10 \quad \text{Substitute x in the equation by 25}$$

$$y = 3(25) - 10$$

$$y = 75 - 10$$

$$y = 65$$

Step 4. Check answers directly against the facts of the problems. Substitute the value of x and y to the equation

$$y = 3x - 10$$

$$65 = 3(25) - 10$$

$$65 = 75 - 10$$

$$65 = 65 \checkmark$$

Therefore, the total cost of a 25 km ride is Php65.00

Graphing the solutions of the linear equations in two variables can also model real-life situations. Presented below is an example.

Example 3.

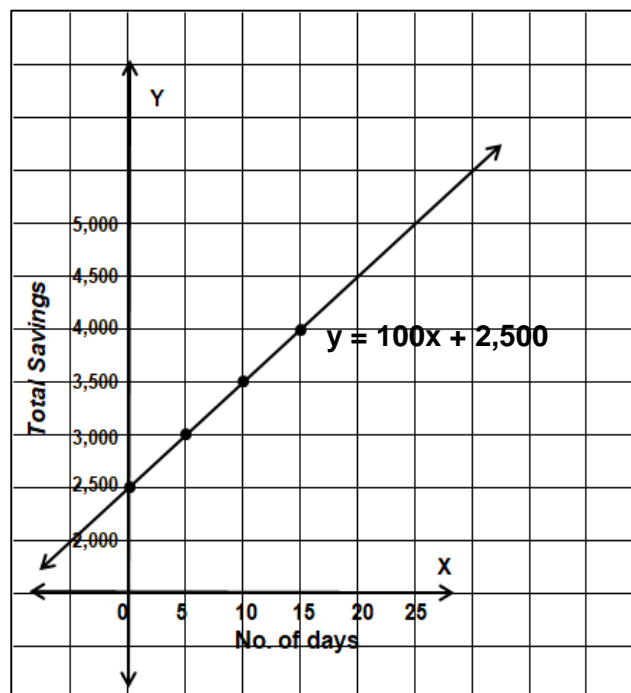
Jianne wants to buy a new android mobile phone. She has already *Php*2,500 in her savings account, but the amount is not enough, so she needs to save more in order to buy the phone. Her total savings can be modelled as $y = 100x + 2,500$ where y is her total savings, and x is the number of days to save. Graph this equation and see how much she can save in 15 *days*. If the amount of the mobile phone is *Php*4,450, will Jianne be able to save enough in 20 days?

Solution:

First we need to create a table of values for the equation $y = 100x + 2,500$. We can assign nonnegative values of x to find the corresponding values of y .

Number of days (x)	$y = 100x + 2,500$	(number of days, total savings) (x, y)
0	$y = 100(0) + 2,500$ $y = 0 + 2,500$ $y = 2,500$	(0, 2500)
5	$y = 100(5) + 2,500$ $y = 500 + 2,500$ $y = 3,000$	(5, 3000)
10	$y = 100(10) + 2,500$ $y = 1000 + 2,500$ $y = 3,500$	(10, 3500)
15	$y = 100(15) + 2,500$ $y = 1,500 + 2,500$ $y = 4,000$	(15, 4000)

Plot the ordered pairs on a Cartesian plane. Draw the line that passes through the points and contains all the solutions of the equation.



The graph above shows that Jianne can save **Php4,000** in **15 days**. If we are going to determine the corresponding ordered pair from the table, we have (15, 4000). To check whether this ordered pair satisfies the equation, let us substitute it to the equation $y = 100x + 2,500$:

$$y = 100x + 2,500$$

$$4,000 = 100(15) + 2,500$$

$$4,000 = 1,500 + 2,500$$

$$4,000 = 4,000 \checkmark$$

To answer if Jianne can save enough amount in 20 days to buy a mobile phone worth Php4,450.00, we can substitute $x = 20$ to $y = 100x + 2,500$,

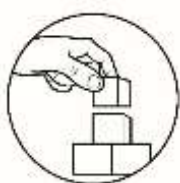
$$y = 100x + 2,500$$

$$y = 100(20) + 2,500$$

$$y = 2,000 + 2,500$$

$$y = 4,500$$

Notice also that in the graph, we have the coordinate (20, 4 500). This means that, in 20 days Jianne will be able to save enough amount to buy a mobile phone worth Php4,450.



What's More

Activity 1: Watch Your Steps

Directions: Complete the steps in solving word problems involving linear equations in two variables by supplying the required information. Write your answer on a separate sheet of paper.

Reena begins to save for a new pair of shoes that cost PhP 2, 375.00. She already has PhP 500.00 and plans to save Php 75.00 per week. How long does she have to save to buy the shoes?

Solution:

Step 1. Understand the Problem.

Given:

Asked:

Let x represents the _____

Let y) represents the _____

Step 2. Translate the problem into an equation in two variables.

Make a table of values.

x					
y					

Total amount saved = (savings per week x number of weeks)
+ _____

$$y = \underline{\hspace{2cm}}$$

Step 3. Find the solution using the formulated equation.

y	=	_____ + 500	Equation
2375	=	_____ + 500	By substitution
$2375 + (-500)$	=	_____ + 500 + (-500)	By Addition Property of Equality
_____	=	_____	By simplification
1875	=	_____ x	Division Property of Equality
_____	=	x	By simplification

Step 4. Check the solution obtained by substituting the solution/s to the original equations.

y	=	_____ + 500
2375	=	$75(\underline{\hspace{1cm}}) + 500$
2375	=	_____ + 500
2375	=	_____

Hence, Reena needs to save for _____ weeks.

Activity 2: How Much Should Be Paid?

Direction: Read the situation and answer the questions that follow.

A tricycle passenger is charged P8.00 for the regular fare for the first 3 kilometers and an additional of P1.50 per succeeding kilometer.

Questions:

1. What equation shall represent the situation?
2. How much will a tricycle passenger pay for a total of 8 kilometers travel?



What I Have Learned

Directions: Enumerate the steps in solving problems involving linear equations in two variables.

First, I have to

Second, I will

Third, I will

Finally, I will identify the solution of the linear equation in two variables by...



What I Can Do

Activity: “Be Fit and Fab!”

You want to achieve a fit and healthy body, so you joined a fitness club in your community and incorporate it with proper diet for you to lose an average of 7 pounds each month. At the end of 3 months, you weigh 130 pounds.

Questions:

- What linear equation would best represent the situation?
- What is your weight in 5 months of exercise?
- If your original weight is 151 pounds, how many pound will you lose in 7 months?



Assessment

Directions: Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. Which of the following is the correct sequence in solving problems involving linear equation in two variables?
- I. Read and understand the problem
 - II. Translate the problem into an equation in two variables
 - III. Find the solution using the formulated equation
 - IV. Check the solution obtained by substituting the solution/s to the original equations

A. I, II, III, IV
B. I, III, II, IV

C. I, III, IV, II
D. II, I, III, IV

For item numbers 2 to 4, refer to the situation below.

Suppose a survey is made on the number of people infected by the Corona Virus Disease-2019 (COVID-19) from February 2020 to June 2020. The result was tallied and it was observed to increase at a constant rate as shown in the table below.

Month	February	March	April	May	June
Number of people infected by the Coronavirus Disease 2019 (COVID-19)	20	28	36	44	52

2. What is the equation that would represent the situation?
- A. $y = -8x + 20$ C. $y = 8x + 20$
B. $y = -8x + 12$ D. $y = 8x + 12$
3. If the pattern continues, can you predict the number of infected people by the month of August 2020?
- A. Yes, the number of infected people by the month of August 2020 is 68.
B. Yes, the number of infected people by the month of August 2020 is 76.
C. No, because it is not stipulated in the problem.
D. No, because the data is insufficient.
4. How many people will be infected by Coronavirus Disease 2019 (COVID-19) in the month of July?
- A. 58 C. 68
B. 60 D. 72

For items 5 to 7: A vendor buys apples and oranges to be sold in a sidewalk. An apple costs Php20.00 each and an orange costs Php15.00 each. The vendor has only Php1,000.00 to spend.

5. If x is the number of apples and y refers to the number of oranges, which linear equation in two variables best models the situation?

A. $20x + 15y = 1,000$	C. $15x + 20y = 1,000$
B. $15x + 1000y = 20$	D. $20x - 15y = 1,000$

6. If the vendor wants to buy 35 apples, how many oranges can he buy from his remaining money?

A. 15	C. 25
B. 20	D. 30

7. If the vendor wants to buy 32 oranges, how many apples can he buy from his remaining money?

A. 26	C. 28
B. 27	D. 30

8. Mr. Willy has a rental business. He has bikes for rents with charges that can be estimated by a linear equation $P = 7k + 100$, where k is the number of kilometers a customer drives. If you are a customer, how much will you pay for the rent, if you drive a total of 5 km?

A. Php 121	C. Php 135
B. Php 128	D. Php 142

9. Jamie rents a generator for Php 1,200.00 and an additional charge of Php150.00 per hour of usage. How much will he pay after using it for 8 hours?

A. Php 2,400.00	C. Php 2,800.00
B. Php 2,500.00	D. Php 3,000.00

For items 9-10: Refer to the situation below:

A tricycle passenger is charged Php10.00 for the first 4 kilometers and an additional of Php1.50 per succeeding kilometer.

10. What equation can be used to model the situation?

A. $y = 1.50x + 10$	C. $y = 1.50x + 4$
B. $y = 10x + 1.50$	D. $y = 1.50 + 4x$

11. How much should be paid for a total travel of 35 kilometers?

A. Php 56.50	C. Php 72.50
B. Php 62.50	D. Php 82.50

For numbers 12 – 14. Refer to the table below:

Trina rents a costume for her school activity. The amount she has to pay per hour is presented in the table below.

<i>No. of hours (x)</i>	1	2	3
<i>Cost in Pesos (y)</i>	30	40	50

12. What is the equation to represent the situation?

A. $y = -10x + 20$

C. $y = 10x + 20$

B. $y = \frac{-1}{10}x + 2$

D. $y = \frac{1}{10}x - 2$

13. How much should Trina pay in 5 hours? What is the y – *intercept* of the equation?

A. 55

C. 70

B. 60

D. 80

14. If Trina returned the costume after 24 hours, how much would she have to pay?

A. *Php* 200.00

C. *Php* 240.00

B. *Php* 220.00

D. *Php* 260.00

15. A Disc Jockey (DJ) hired to host a wedding after-party charges *Php*5,000.00 and an additional of *Php*350.00 per hour. Would it be possible for the DJ to receive a payment of not less than *Php*6,000.00 after hosting the party for 3 hours?

A. No, because the charge per hour is very low.

B. No, because 3 hours of hosting will not be enough to earn at least *Php*6,000.00

C. Yes, because 3 hours of hosting is equivalent to an additional fee of *Php*1,050.

D. Both A & B



Additional Activities

Let's Create

Directions: Create a matrix showing the importance of solving problems involving linear equations in two variables in dealing with real-life situations. Highlight one application for each of the following categories: personal, at home, and in the community and write a brief description of each application. Below is a suggested template.

Applications	Description
A. Personal:	
B. At Home:	
C. In the Community:	

Each of your cited applications will be rated using the following rubric.

Criteria	Performance Level			
	Not Yet Meeting Expectations (2 points)	Minimally Meeting Expectations (3 points)	Fully Meeting Expectations (4 points)	Exceeding Expectations (5 points)
Output Requirements	Output meets some requirements, guidelines and objectives	Output meets most requirements, guidelines and objectives	Output meets all requirements, guidelines and objectives with the capacity to advance	Output exceeds requirements, guidelines and objectives at an advanced level
Concepts and Applications	Has trouble figuring out the applications of the topic. Descriptions of the cited applications are minimally sensible.	Has figured the applications of the topic. Descriptions of the cited applications are adequately sensible.	Has clearly cited the applications of the topic. Descriptions of the cited applications are proficiently sensible.	Has clearly cited the applications of the topic. Descriptions of the cited applications are excellently sensible.
Critical Thinking	Little abstraction beyond facts	Only modest abstraction beyond facts	Some potential aspects are missed	All key aspects identified, related and rigorously evaluated

Perfect Score: 45 Points



Answer Key

What I Know

What's In

1. $2x = 6$
2. $4 + x = 10$
3. $7 + 3x = 98$
4. $25 - 2x = 12$
5. $x + 3 = 25$
6. $3x - 9 = 100$

Assessment

1. A
2. D
3. A
4. B
5. A
6. B
7. A
8. C
9. A
10. C
11. A
12. C
13. C
14. D
15. C

What's More

Activity 1: Watch your Steps

Step 1. Understand the Problem

Given:

- Reena has an initial savings of Php 500.00
- She needs to save a total amount of Php 2,375.00
- She plans to save Php75 per week

Asked: How many weeks will does Reena need to save?

Let x represents the no. of weeks Reena has to save

Let y represents the total amount in Php of Reena's savings

Step 2. Translate the problem into an equation in two variables.

Total amount saved = (savings per week \times number of weeks) +

initial amount of savings

$$y = 75x + 500$$

Step 3. Find the solution using the formulated equation.

Equation	$75x + 500$	$=$	y
By substitution	$75x + 500$	$=$	2375
By Addition Property of Equality	$75x + 500 + (-500)$	$=$	(-500)
By simplification	$75x$	$=$	1875
Division Property of Equality	$\frac{75x}{75}$	$=$	$\frac{1875}{75}$
By simplification	x	$=$	25

Step 4. Check the solution obtained by substituting the solution/s to the original equations.

y	$=$	$75x + 500$
2375	$=$	$75(25) + 500$
2375	$=$	$1875 + 500$
2375	$=$	2375
2375	$=$	<u>2375</u> TRUE

Hence, Reena needs to save for 25 weeks.

Activity 2:

$$1. \quad y = 1.5x + 3.5$$

$$2. \quad \text{Php}15.50$$

1. $y = -7x + 151$
2. 116 pounds
3. 49 pounds

What Can I Do

References

- Acelajado, Maxima J. (2008).Intermediate Algebra.pp.319-326.Makati City, Philippines.
Diwa Learning Systems Inc.
- Abuzo, Emmanuel P., Bryant, Merden L., Cabrella, Jem Boy B., et. al (2013). Mathematics
Grade 8 Learner's Module. pp. 192-195 & 202. Philsports Complex, Meralco
Avenue, Pasig City, Philippines. Book Media Press, Inc. & Printwell, Inc.
- Basilio, Faith B., Chua, Edna A., Jumawan, Maria T., Mangabat, Lawrence Oliver A.,
Mendoza, Mario B., Pacho, Elsie M., Tamoria, Ferdinand V., Villena, Eufrosina
S., Vizcarra, Florante O., Yambao, Teresa M. (2003). Fundamental Statistics.
Philippines. pp. 129 -133. Trinitas Publishing Inc.
- Diaz, Zenaida B., Mojica, Maharlika P. et al (2013). The New Grade 8, Next Century
Mathematics. Pp. 281 – 287. Quezon City, Phoenix Publishing House, Inc.
- Garcia, George A. (2003). Fundamental Concepts and Methods in Statistics (Part 1). pp. 4
– 9. Manila, Philippines. University of Sto. Tomas Publishing House.
- Garcia, George A. (2004). Fundamental Concepts and Methods in Statistics (Part2). pp. 8 –
43. Manila, Philippines. University of Sto. Tomas Publishing House.
- Glencoe/McGRAW-HILL. (1986). Mathematics Skills for Daily Living. pp. 397 - 411.
United States of America. Laidlaw Brothers, Publishers.
- Price, Jack/ Rath, James N./ Leschensky, William.(1989). Pre- Algebra, A Problem Solving
Approach. pp. 420 – 430. Columbus, Ohio. Merrill Publishing Co. 637

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