Module 3
Linear Functions

What this module is about

This module is about the application of linear functions in everyday situations. As you go over the different problems you will apply your knowledge and skills related to linear equations and functions in solving problems. The lessons were presented in a very simple way so it will be easy for you to understand and be able to solve problems alone without difficulty. Treat the lesson with fun and take time to go back if you think you are at a loss.

What you are expected to learn

This module is designed for you to:

1. recall the different steps in solving word problems
2. translate verbal statements into symbols
3. apply knowledge and skills related to linear functions in solving problems.

How much do you know

A. Write an equation to show the functional relationship between the two quantities involved in the problems using the indicated variables.

1. The area (A) of a square of side s is s^2.
2. The perimeter of a rectangle is equal to twice the length plus twice the width.
3. 12x plus seven is equal to 3x reduced by 4
4. The circumference (C) of a circle is twice the product of π and the radius (r).
5. The total distance (d) covered is equal to the product of the rate (r) and the time (t).

B. Solve the following problems.

6. A car can run 98.4 km (d) on 12 liters (L) of gasoline. How far can the car go on 30L of gasoline?

7. Twelve increased by 3 times a number is 21. Find the number.

8. Sue's allowance is 3 times as much as Gloria's allowance. If the sum of their allowance is P480, how much is Gloria's allowance?

9. Jenna is y years old. Kim is 5 years older than Jenna. Together, their ages total 31. How old is each girl?

10. The sum of three consecutive integers is 15. What are the numbers?

What you will do

Lesson 1

Problems on Everyday Situations

There are many real-life situations that can be solved through linear function because the relationship involves more than two variables. It is a function if one of them is related to one of the other variables but there are cases wherein the dependent or independent variable is already given and so you are not required to show functional relationship.

Steps in Solving Word Problems:

1. Understand the problem. Read and analyze the situation.

2. Make a plan. List down all the given data. Determine the unknown and what is asked in the problem.

3. Carry out the plan. Write the equation that describes the relationship between the variables and solve the equation.

4. Look back. Examine if the solution obtained is meaningful to the problem solved.

Example 1

The bus transport fare is a function of d defined as

$$f(d) = 5.5 + 0.8d$$

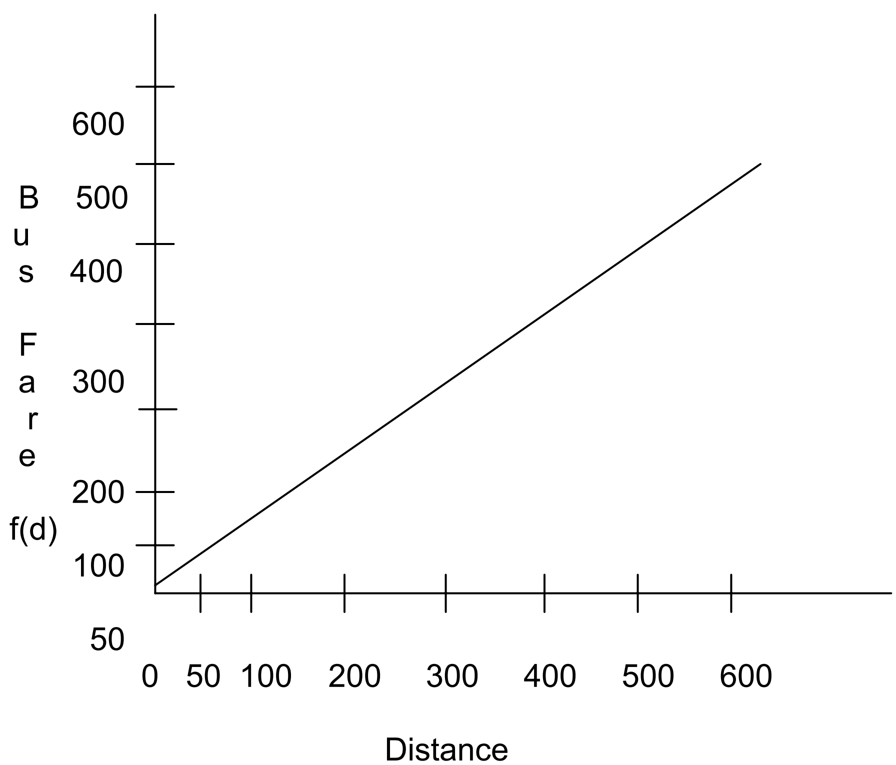
where d is the distance traveled in kilometers.

a. Draw the graph of f(d) for $0 \le d \le 600$.
b. Estimate the bus fare from Quezon City Vigan City which is approximately 410 km.
c. How far would a passenger travel for a bus fare of P380?

Solution:

a. Choose convenient values for d. Then compute the corresponding values for f.

D	0	50	100	200	300	400	500	600
f(d)	5.50	45.50	85.50	165.50	245.50	325.50	405.50	485.50



b. $f(410) = 5.5 + 0.8(410)$
$= 5.5 + 328$
= P333.50 is the estimated fare for a 410-km trip.

c. $f(d) = 5.5 + 0.8d$
$380 = 5.5 + 0.8d$
$380 – 5.5 = 0.8d$
$374.5 = 0.8d$
$\frac{374.5}{.8} = d$

d = 468.13 is the estimated distance traveled for a P380 trip.

Example 2

Janet sells ticket to a musical play. She has now collected an amount equivalent to 2 adult tickets and 14 student tickets or 4 adult tickets and 10 student tickets.

Write an equation in standard form of the linear function that represents the amount of money (in hundred pesos) Janet has collected.

Solution:

Let x represent the number of adult tickets sold
y represents the number of student tickets sold
A is the price of the adult tickets
B is the price of the student tickets
C is the amount of money collected

Our equation in standard form is

$$Ax + By = C$$

The ordered pairs (2, 14) and (4, 10) represent the two points in the graph of the equation.

Using the formula for slope,

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 14}{4 - 2} = \frac{-4}{2} = -2$$

Using the slope-intercept formula,

$$y - y_1 = m(x - x_1), \qquad \text{with the point (2, 14)}$$
$$y - 14 = -2(x - 2)$$
$$y - 14 = -2x + 4$$
$$2x + y = 18$$

The equation in standard form is $2x + y = 18$. If the amount expressed in hundred pesos, Janet has P1800 is adult tickets cost P200 and student tickets cost P100.

Using (2, 14)	Using (4, 10)
$2(200) + 14(100) = 1800$	$4(200) + 10(100) = 1800$
$400 + 1400 = 1800$	$800 + 1000 = 1800$

Example 3

A computer manufacturer needs to purchase microchips. The supplier charges P3000 for the first 100 chips ordered and P19 for each chip purchased over this amount.

a. Find the c(x) where x represents the number of chips ordered.
b. Use your function to find the cost of 2020 chips.

Solution

Let x represents the number of chips
x – 100 represents the number of chips over and above 100.

a. $c(x) = 3000 + 19(x - 100)$

$= 3000 + 19x - 1900$

$c(x) = 19x + 1100$

b. $c(2020) = 19(2020) + 1100$

$= 38380 + 1100$

$= 39480$

The cost of 2020 microchips would be P39480.

Example 4

A wire is 64 meters long. If it is cut so that one piece is twice as long as the other, how long will each piece be?

Solution:

Let x = the shorter piece
$2x$ = the longer piece

Then $x + 2x$ = sum of the two pieces and this is 64 meters

Thus,

$$x + 2x = 64$$

$$3x = 64$$

$$x = 21\frac{1}{3} \text{ meters, shorter piece}$$

$$2x = 42\frac{2}{3} \text{ meters, longer piece}$$

$$21\frac{1}{3} + 42\frac{2}{3} = 64$$

Try this out

Analyze and solve:

1. An overseas Filipino worker works in the Budget Department in Saudi Arabia. He found out that the cost C, in US dollars, of repairing a city street in that country is estimated using the function $C(m) = 2{,}000 + 6{,}000m$, where m is the number of kilometers to be repaired.

   a. Draw the graph of the function for $0 \le m \le 10$.
   b. Estimate the cost of repairing 7 kilometers of a city street.
   c. How many kilometers of city street would be repaired if the Budget Department allotted $50,000?

2. Roberto receives a commission of P150 for every cellphone he sells. On top of the commission, he receives a monthly salary of P5,000.

a. What is his commission if he sells 25 cellphones?
b. To make a commission of P1,200, how many cellphones should he sell?
c. What is his income if he sells 100 cellphones in a month?
d. How many cellphones should he sell in a month to make an income of P15,000?
e. Let *I represent the monthly income, and n represent the number of cellphones sold. Express the function I* in terms of n.

3. A company that manufactures guitars buys guitar strings from a supplier who charges P 5,500 for the first 180 strings ordered and P320 for each additional string purchased. Find the cost function c(x), and use it to calculate the cost of 200 guitar strings.

4. The fee for renting a word processor is P2,000 plus P600 for each day you keep the machine. The total fee can be expressed by F = 2,000 + 600d, where F is the total fee and d is the number of days the machine is rented.

a. Complete the table.

Number of days (d)	1	2	3
Rental fee (F)	P2600		

b. How much will he spend for 6 days?
c. Jose can spend no more than P10,000 in rental fees. For how many days can he rent a word processor?

Lesson 2

Problems on Direct Variation

Direct variation is a special case of the linear function y = mx + b, where m ≠ 0 and b = o. The graph of this function is a line passing through the origin and slope m.

If a linear function is a direct linear variation, then for any two ordered pairs (x_1, y_1) and (x_2, y_2) determined by f, with $x_1, x_2 \neq 0$, the equation

$$\frac{y_1}{x_1} = \frac{y_2}{x_2}.$$

Example 1

The amount of rice used in a casserole recipe is directly proportional to the number of people served. If 2 cups of uncooked rice serve 6 people, how many cups of rice would be needed to serve a group of 40 people?

Solution

Let r = number of cups of rice
p = number of people to be served

The two ordered pairs determined by the variation are (2, 6) and (r, 40)

Thus, $\frac{6}{2} = \frac{40}{r}$

$6r = (2)(40)$

$\frac{6r}{6} = \frac{80}{6}$

$r = 13\frac{1}{3}$

$13\frac{1}{3}$ cups are needed for 40 people.

Example 2

The distance measured on a map varies directly with the actual distance. If 2 cm represents 30 km, how many kilometers represented by 9 cm?

Solution:

Let x = the number of kilometers equivalent by 9 cm.

The two ordered pairs determined by the variation are (2, 30) and (9, x)

Thus, $\frac{30}{2} = \frac{x}{9}$

$$2x = (30)(9)$$
$$2x = 270$$
$$x = \frac{270}{2} = 135$$

A distance of 9 cm on the map is equivalent to an actual distance of 135 km.

Try this out

Solve:

1. Ferdie's car uses 15 liters of gasoline to travel 200 kilometers. In that rate, how much gasoline will his car use to travel 300 kilometers?

2. Mr. Cruz used 3.2 m of copper wire which weighs 0.45 kg. How much will 6 m of copper wire weigh?

3. The amount of interest earned on a savings account is directly proportional to the amount of money in the account. If P25,000 earns P350 interest, how much interest is earned on P80,000?

4. The distance between two points on a map is directly proportional to the actual distance between the locations. On a map, the distance between Vigan and Laoag measures 6 cm. and the distance between Vigan and La Union measures 9 cm. If the actual distance from Vigan to Laoag is 20 km., how far is it from Vigan to La Union?

5. Nine cubic meters of oxygen are kept under constant pressure while oxygen's temperature is raised from 300^0 Kelvin to 350^0 Kelvin. What is the new volume?

Lesson 3

Number Problems

This is another type of problem. Many students could not solve this type of problem easily because they fail to translate correctly the different expressions given by the word problem into a correct equation.

In the following examples, you will see that before you solve a word problem, you must first translate the word problem into an equation.

Example 1

Find two numbers whose difference is 50 and whose sum is 80.

Solution:

Let x = one number
$x - 50$ = the other number
80 = sum of the two numbers

Equation:

$$x + (x - 50) = 80$$
$$2x - 50 = 80$$
$$2x - 50 + 50 = 80 + 50$$
$$2x = 130$$
$$\frac{2x}{2} = \frac{130}{2}$$
$$x = 65 \quad \text{one number}$$

$$x - 50 = 15 \quad \text{the other number}$$

To check the difference of the two numbers must be 50 and their sum must be 80.

$$65 – 15 = 50$$
$$65 + 15 = 80$$

Therefore, our solution is correct.

Example 2

Find three consecutive integers whose sum is 75.

Solution:

let x = the first integer
$x + 1$ = the second integer
$x + 2$ = the third integer

The equation is:

$$x + (x + 1) + (x + 2) = 75$$
$$3x + 3 = 75$$
$$3x + 3 - 3 = 75 - 3$$
$$3x = 72$$
$$\frac{3x}{3} = \frac{72}{3}$$

$x = 24$ the first integer

$x + 1 = 25$ the second integer

$x + 2 = 26$ the third integer

Adding the three integers

$$24 + 25 + 26 = 75$$

Example 3

Find five consecutive odd integers if the sum of the first and the fifth is 1 less than three times the fourth.

Solution:

Let x = the first odd integer
$x + 2$ = the 2nd odd integer
$x + 4$ = the 3rd odd integer
$x + 6$ = the 4th odd integer
$x + 8$ = the 5th odd integer

The equation is:

$$x + (x + 8) = 3(x + 6) - 1$$
$$2x + 8 = 3x + 18 - 1$$
$$2x + 8 = 3x + 17$$
$$2x + 8 - 8 = 3x + 17 - 8$$
$$2x = 3x + 9$$
$$2x - 3x = 3x + 9 - 3x$$
$$--x = 9$$
$$x = -9$$ The 1st odd integer

$x + 2 = -7$	The 2nd odd integer
$x + 4 = -5$	The 3rd odd integer
$x + 6 = -3$	The 4th odd integer
$x + 8 = -1$	The 5th odd integer

Check with the statement:

$$x + (x + 8) = 3(x + 6) - 1$$

$$-9 + -1 = 3(-3) - 1$$

$$-10 = -9 - 1$$

It checks!

Try this out

Write an equation in each sentence.

1. A number decreased by 12 is 8.
2. The product of 8 times a number is 56.
3. Find three consecutive integers whose sum is 99.
4. Let m be a multiple of 7. What are the next two multiples of 7.
5. Three times the sum of a number and 3 is -18.

Analyze and solve.

1. Find three consecutive odd integers whose sum is 159.

2. Twice the sum of a number and 5 is 2 les than six times the number.

3. Thrice the second of three consecutive odd integers equals 51. Find the largest of the integers.

4. Seven more than three times a certain number is the same as 13 less than five times the number. Find the number.

5. Find three consecutive even integers if their sum, decreased by the third, equals 22.

Lesson 4

Age Problems

The key to solving age problems, like all other problems lies in writing the correct equation above everything else.

Example 1

Gary is 8 years older than his sister Gia. The sum of their ages is 46. Find their present ages.

Solution:

let x = the age of Gia
$x + 8$ = the age of Gary
46 = the sum of their present ages

The equation:

$$x + (x + 8) = 46$$

$$2x + 8 = 46$$

$$2x + 8 - 8 = 46 - 8$$

$$2x = 38$$

$$\frac{2x}{2} = \frac{38}{2}$$

$x = 19$ is the age of Gia

$x + 8 = 27$ is the age of Gary

Hence, the sum of their ages is 46.

Example 2

Fernando is thrice as old as his son. Twelve years from now, he will be twice as old as his son. How old is Fernando now?

Solution:

	Present age	Age in 12 years
Son	x	x + 12
Fernando	3x	3x + 12

In 12 years, Fernando will be twice his son's age

$$3x + 12 = 2(x + 12)$$

$$3x + 12 = 2x + 24$$

$$3x + 12 - 12 = 2x + 24 - 12$$

$$3x = 2x + 12$$

$$3x - 2x = 12$$

$$x = 12$$

		In 12 years
Son's present age	$x = 12$	24
Fernando's present age	$3x = 36$	48

In 12 years Fernando's age, 48, is twice his son's age, 24.

Example 3

Bob was thrice as old as John 5 years ago. Now he is only twice as old as John. How old are they now?

Solution:

let x = John's present age
$2x$ = Bob's present age

	Present age	5 years ago
John	x	x - 5
Bob	2x	2x - 5

Bob's age 5 years ago = Thrice John's age 5 years ago

$$2x - 5 = 3(x - 5)$$

$$2x - 5 = 3x - 15$$
$$2x - 5 + 5 = 3x - 15 + 5$$
$$2x = 3x - 10$$
$$2x - 3x = -10$$
$$-x = -10$$
$$x = 10 \text{ years, present age of John}$$
$$2x = 20 \text{ years, present age of Bob}$$

Check with the statement.

$$2x - 5 = 3(x - 5)$$
$$2(10) - 5 = 3(10 - 5)$$
$$20 - 5 = 3(5)$$
$$= 1$$

Try this out

A. Use the given variable to write the indicated expression or equation.

1. Let *m* be Jezreel's age now.

   a. What was his age 5 years ago?
   b. If Jemimah is two years younger than Jezreel, represent her age now.
   c. What was Jemimah's age 5 years ago?
   d. If 5 years ago the sum of their ages was 36, write an equation to represent this.

B. Analyze and solve.

1. Susie is three times as old as Lita four years ago. Susie is two years older than Lita. How old are Susie and Lita?

2. Elaine is 5 years younger than her cousin Ding. The sum of their ages is 15. Find the age of Ding.

3. Joyce is twice as old as Rico. In 12 years, the sum of their ages is 36. Find their present ages.

4. A man is 20 years old. His daughter is 5. In how many years will the man's age twice his daughter's age?

5. What is Ann's present age if in 20 years, she will be three times as old as is now?

Lesson 5

Coin Problems

In solving this type of problems you follow the same basic procedure and technique you use in solving number and age problems.

Example 1

From his baon, Kiko saved P3.75 consisting of 50 centavo and 25 centavo coins. If there are 12 coins in all, how many of each kind does he have?

Representation:

x = no. of 50¢ coins
12 – x = no. of 25¢ coins

For uniformity of denomination, let's convert P3.75 to centavos, so we have 375¢.

Equation:

$$50x + 25(12 - x) = 375$$
$$50x + 300 - 25x = 375$$
$$25x + 300 = 375$$
$$25x + 300 - 300 = 375 - 300$$
$$25x = 75$$
$$\frac{25x}{25} = \frac{75}{25}$$
$$x = 3$$

Therefore,

3 = no. of 50¢ coins = 3(.50) = 1.50
12 – x = 9 = no. of 25¢ coins = 9(.25) = 2.25
P 1.50 + P 2.25 = P 3.75

Example 2

Tickets to the Mathematics Variety Show were sold at P100, P50 and P25. Diane, the president of the club, sold thrice as many P 100 as P 50 – tickets and twice as many P 25 as P 100 tickets. If she sold 30 tickets in all, remitting to the club P 1500, how many of each kind did she sell?

Representation:

Let x = no. of P 50 tickets

3x = no. of P 100 tickets

2(3x) = 6x no. of P 25 tickets

Equation:

$$50x + 3x(100) + 6x(25) = 1500$$
$$50x + 300x + 150x = 1500$$
$$5\,00x = 1500$$
$$\frac{500x}{500} = \frac{1500}{500}$$
$$x = 3$$

therefore,

x	=	3 no. of P 50 tickets	= 3(50)	=	P 150
3x	=	9 no. of P 100 tickets	= 9(100)	=	900
6x	=	18 no. of P 25 tickets	= 18(25)	=	450
		The total remittance		=	P 1500

Try this out

Solve the following problems.

1. Alex has 30 coins in 25¢ and 50¢ totaling P10.00. How many of each kind of coin does he have?

2. There are 30 coins in Jezreel's collection of one-peso coins and five-peso coins. The collection has a face value of P 82.00 How many one-peso and five-peso coins are there?

3. Gary's Concert at Metropolitan Theatre was attended by 685 persons. Some bought general admission tickets for P 50 each and the rest bought reserved seat tickets for P75 each. The total amount of money collected from these tickets was P40,000. How many people bought reserved seat tickets?

4. Ana saved p 4.75 from her day's baon consisting of 50¢ and 25¢ - coins. How many of each kind does she have if there are 10 coins in all?

5. Milo bought thrice as many soap bars as bottles of shampoo which each costs P22 and P42, respectively. How much of each kind did Milo buy if he paid P324?

Lesson 6

Mixture Problems

A type of problem that chemist and pharmacist often encounter is the need to change the concentration of solutions or other mixtures. In such problems, the amount of a particular ingredient in the solution or mixture is often expressed as a percent of the total.

Example 1

A 50 ml solution of acid in water contains 25% acid. How much water would you add in order to make a 10% acid solution?

Solution:

Let x = number of milliliters of water to be added.

	Substance	Total amt. in ml	Amt. of pure acid
Start with	25% acid solution	50	0.25(50)
Add	water	x	0
Finish with	10% acid solution	x+ 50	0.10(x + 50)

Since the number of milliliters of pure acid stays the same, the first and the entries of the last column are equal.

$0.25(50) = 0.10(x + 50)$ Multiply each side by 100

$25(50) = 10(x + 50)$

$1250 = 10x + 500$

$1250 – 500 = 10x + 500 – 500$

$750 = 10x$

$75 = x$

75 ml of water must be added

Example 2

I have two kinds of candy, one of which is selling at P 8.00 per kilo and the other at P 6.00 per kilo. How many kilos of the P 6.00 candy can I mix with 20 kilos of the P 8.00 kilo candy to have a mixture that I can sell at P 7.00 per kilo?

Solution:

Let x = kilos of P 6.00 candy in the mixture

	Unit cost	Amount	Total cost
P 8.00/kilo candy	P 8	20	8(20) = 160
P 6.00/ kilo candy	P 6	x	6x
Mixture	P 7	20 + x	7(20 + x)

Equation:

Value of final solution = Value of P 8/kilo candy + Value of P 6/kilo candy

$$7(20 + x) = 160 + 6x$$
$$140 + 7x = 160 + 6x$$
$$7x - 6x = 160 - 140$$
$$x = 20$$ kilos of P 6/ kilo candy to be mixed.

To check:

20 (P8) = P160
20 (P6) = 120
Total Value = P 280

Cost per kilo $= \frac{280}{20+20} = \frac{280}{40}$ = P 7.00

Try this out

A. Copy and complete the table.

Substance	Total amount of solution	Amount of substance in the solution
1. 25% acid solution	150 ml	
2. 35% alcohol solution	250 l.	
3. pure acid	540 g	

B. Answer the following problems

1. Alfred has 20 kilos of a 5% by weight sugar. How much water should he add to get a solution that contains 3% sugar?

2. How much water should I evaporate from 10 liters of a 3% salt solution if I want a solution containing 5% salt?

3. A vendor makes up a 20-kilo mixture of peanuts and green peas. If the peanuts cost P30 per kilo and the green peas P 22 per kilo, how many kilos of each kind must be used in order for the mixture to cost P 25 per kilo?

4. A food-processing company produces grated cheese made from two types of cheese. One type of cheese costs P29 per kilogram and the other costs P31 per kilogram. How much of each type of cheese was used in making 20 kg of cheese worth P29.50 per kilogram?

Lesson 7

Motion Problems

Motion problems deal with three quantities. They are:

Distance
Rate or speed
Time

All uniform motion problems are tied-up with the formula:

$$\text{Distance} = \text{Time} \times \text{Rate}$$

or

$$D = rt$$

Example 1 (Motion in opposite directions)

Two airplanes stat from the same place and fly in opposite directions. One airplane travels 100 kilometers per hour faster than the other. Two hours later they are 2,260 kilometers apart. Find the rate of each.

Solution:

The sum of the distances is 2,260 km.

Let r = the rate of the slower plane in kilometers per hour

	rate	time	distance
Slower airplane	r	2	2r
Faster airplane	r + 100	2	2(r + 100)

$d_{slower} + d_{faster} = total_{distance}$

$2r + 2(r + 100) = 2260$
$2r + 2r + 200 = 2260$

$4r = 2260$
$r = 515$ km/ h , rate of slower airplane

$r + 100 = 615$ km/ h, rate of faster airplane

To check:

$2r + 2(r + 100) = 2260$
$2(515) + 2(515 + 100) = 2260$
$1030 + 1230 = 2260$
$2260 = 2260$

Example 2

(Motion in the same directions)

An airplane which maintains an average speed of 350 miles per hour passed an airport at 8 am. A jet following that course, at a different altitude, passed the same airport at 10 am and overtook the same airplane at noon At what rate was the jet flying?

Solution:

Let r = rate of the jet in miles per hr

	Rate x	Time =	Distance
Airplane	350	4	350(4) = 1400
Jet	R	2	2r

Distance of jet = distance of airplane

$$2r = 1400$$
$$r = 700$$ miles per hour is the rate of the jet

Try this out

Answer the following problems.

1. Bill and Mike left their house at the same time. Bill walked at the rate of 2 kilometers per hour, while Mike rode a bicycle. At the end of two hours, Mike was 40 km ahead of Bill. What is the speed of Mike?

2. The two planes leave New York at the same time for Manila. The faster plane averages 300 miles per hour. After 3 hours, the planes are 180 miles apart. What is the average speed of the slower plane?

3. A policeman on a motorcycle is pursuing a car that is speeding at 115 km per hour. The policeman is 6 km behind the car and is traveling 130 km per hour. How long will it be before the policeman overtakes the car?

4. One printing press can print 4000 copies an hour, and another can print 6000 copies per hour. After the first press has been running 2 hours, the second press is started. How soon after the second press is started will 40000 copies be printed?

Let's summarize

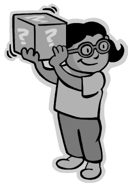
Steps in Solving Word Problems:

1. Understand the problem. Read and analyze the situation.

2. Make a plan. List down all the given data. Determine the unknown and what is asked in the problem.

3. Carry out the plan. Write the equation that describes the relationship between the variables and solve the equation.

4. Look back. Examine if the solution obtained is meaningful to the problem solved.



What have you learned

A. Write an equation to show the functional relationship between the two quantities involved in the problems using the indicated variables.

1. The cost (c) of n cavans of rice at P1200 a cavan.
2. The time (t) required to make a trip of 60 km. if a car goes r km. per hour.
3. The surface area of a sphere S equals 4π times the square of the radius.
4. A number decreased by 12 is 7.
5. The sum of two consecutive integers is 49.

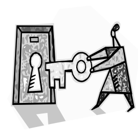
B. Solve the following problems.

6. The amount of flour used in baking bread is directly proportional to the number of loaves of bread. If 6 cups of flour makes 2 loaves of bread, how many cups of flour would be used to make 5 loaves of bread?
7. A jet plane and a prop plane leave the same airport at the same time and travel in opposite directions. The jet travels at 960 km/hr and the prop plane travels at 560 km/h. In how many hours will they be 4560 km apart?

8. The sum of three consecutive even integers is 50 more than the third integer. find the integers.

9. To increase the sugar concentration of a solution from 15% to 40%, how many kilos of pure sugar must be added to 80 kilos of the 15% solution?

10. David is three years older than Jim. Tom is 5 years younger than Jim. The sum of their ages is 34 years. Find their ages.



Answer Key

How much do you know

1. $A = s^2$ 2. $P = 2l + 2w$ 3. $12x + 7 = 3x – 4$
4. $C = 2\pi r$ 5. $d = rt$ 6. 246 km.
7. 3 8. P120 is Gloria's allowance
9. 13, Jean's age
   18, Kim's age
10. 4, 5, 6

Try this out

Lesson 1

1a.

m	0	1	2	3	4	5	6	7	8	9	10
C(m)	2000	8000	14000	20000	26000	32000	38000	44000	50000	56000	62000

b. 44,000 c. 8 km

2.
a. P3750 b. 8 cellphones c. P20,000.00
d. 67 cellphones e. $I = 5,000 + 150n$

3. P11,900

4. a

D	1	2	3
F	2600	3200	3,800

b. P5600 3. 13 days

Lesson 2

1. $22\frac{1}{2}$ liters 2. 0.84 kg 3. P1120.00
4. 30 km 5. 10.5 cubic meters

Lesson 3

A.

1. x – 12 = 8 2. 8x = 56 3. x + (x+1) +(x +2) = 99
4. m + 7, m + 14 5. 3(x + 3) = -18

B.

1. 51 , 53, 55 2. x = 3 3. 19
4. x = 10 5. -12, -10, -8

Lesson 4

A.

a. m – 5 b. m – 2
c. m – 7 d. (m -5) + (m – 7) = 36

B.

1. 5, age of Lita ; 7, age of Susie
2. 10 yrs. old
3. Rico – 4 , Joyce – 8
4. 10 yrs.
5. 10 yrs. old

Lesson 5

1. 20 - 25¢ & 10 - 50¢
2. 17 – P1.00 & 13 – P5.00
3. 455 – P50.00 & 230 – P75.00
4. 9 - 50¢ & 1 - 25¢
5. 3 bottles of shampoo & 9 soap bars

Lesson 6

A.

1. 37.5 ml 2. 87.5 l 3. 540 g

B.

1. 13.33 kilos of water
2. 4 liters
3. 7.5 kl – amount of peanuts
   12.5 kl – amount of green peas

4. 12.75 kg of P29/kl cheese
   7.5 kg of P31/kl cheese

Lesson 7

1. 22 km/hr
2. 240 miles/hr
3. 24 minutes
4. $3\frac{1}{5}$ hrs

What have you learned

1. C = P1200n
2. t = $\frac{60km}{r}$
3. S = $4\pi r^2$
4. n – 12 = 7
5. x + (x +1) = 49
6. 15 cups of flour
7. 3 hrs
8. 24, 26, 28
9. $33\frac{1}{3}$ kilos of pure sugar
10. Tom' age – 7 yrs old
    Jim's age – 12 yrs. old
    Davis's age – 15 yrs. old