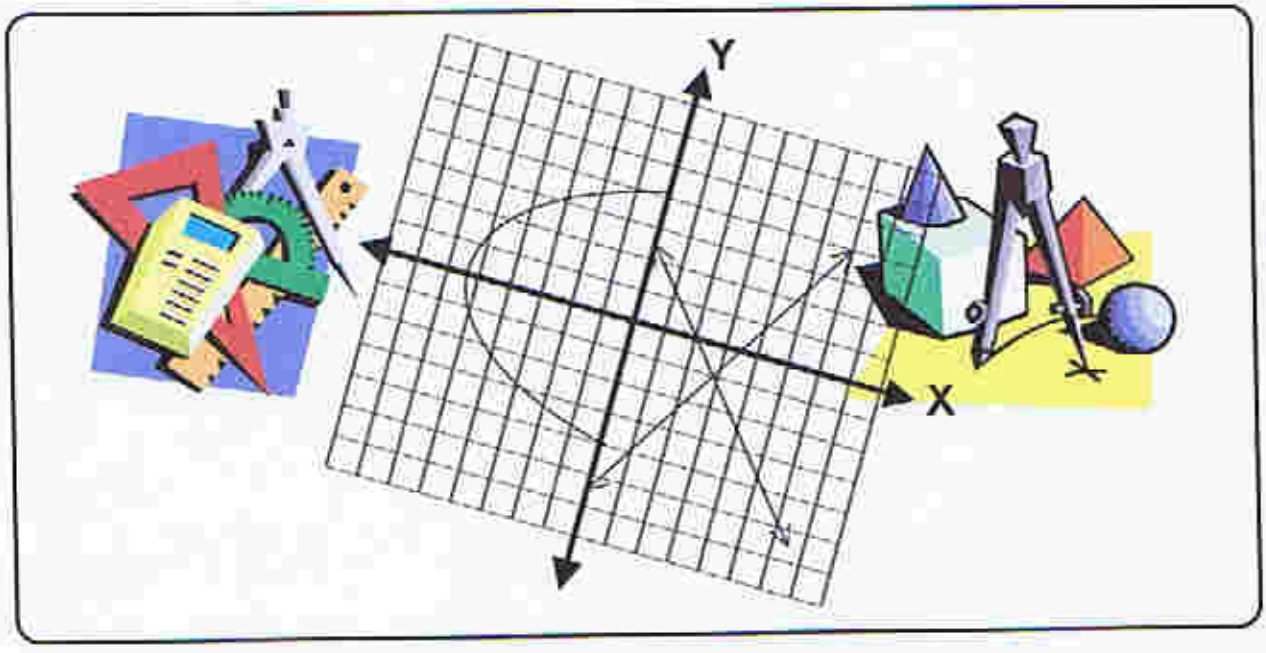
Project EASE

(Effective and Alternative Secondary Education)

MATHEMATICS I



MODULE 9

The R and S in Math

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Module 9
The R and S in Math

What this module is all about

This module is about mathematical phrases, sentences, first-degree equations and inequalities.

In the English language, letters and punctuations are used to create words and phrases. In Algebra, letters along with numbers and symbols of operations are used to create expressions. Expressions together with the relation symbols are used to create equations and inequalities. Such equations and inequalities are used to model and solve real-life problems. You will learn more about these concepts as you study the four lessons in this module.

Lesson 1 ***Mathematical Phrase, Mathematical Sentences, Equations and Inequalities***
Lesson 2 ***Translating Verbal Statements to Equations or Inequalities and vice-versa***
Lesson 3 ***Differentiating First-degree Equations from First-degree Inequalities in One Variable***
Lesson 4 ***Applications of Equations and Inequalities***

What you are expected to learn

After working on this module, the student is expected to:

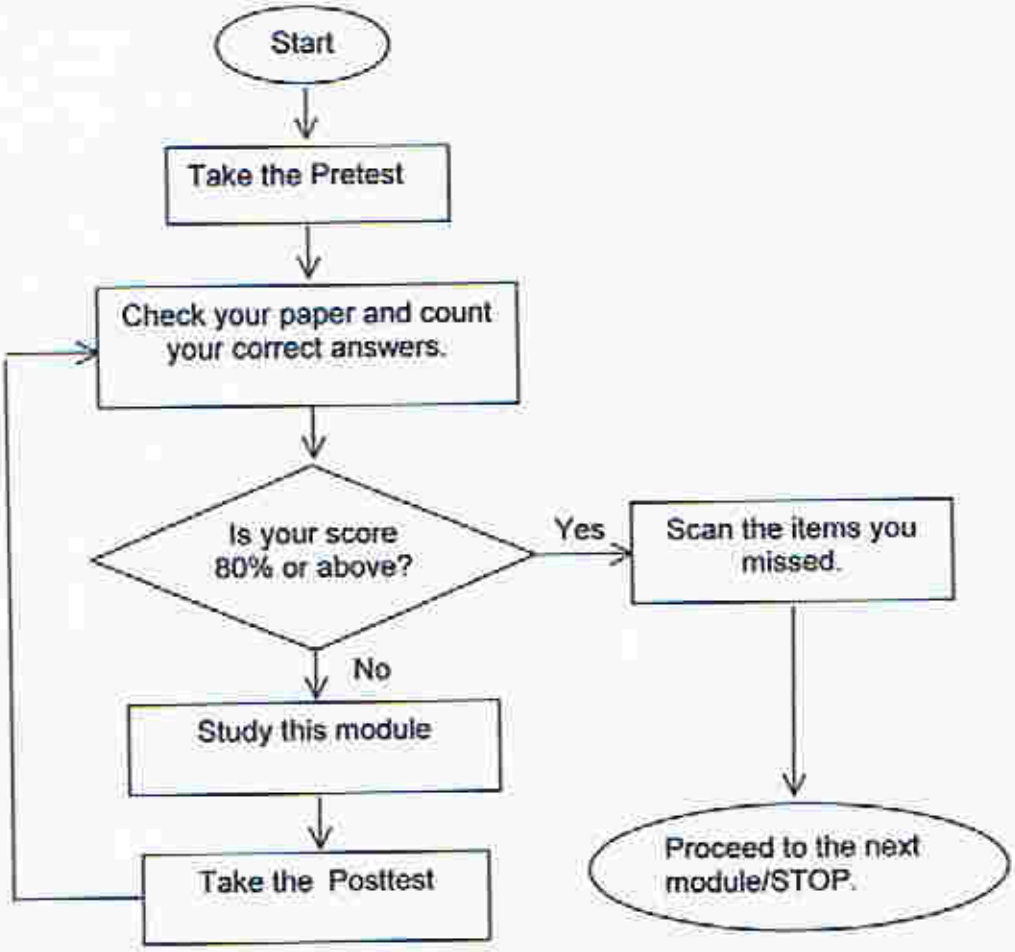
- distinguish between
  - mathematical phrases and mathematical sentences;
  - equations and inequalities;
- translate verbal sentences to equations or inequalities and vice-versa;
- define first degree equations and first-degree inequalities in one variable; and
- apply equations and inequalities in some real-life situations.

How to learn from this module

This is your guide for the proper use of the module:

1. Read the items in the module carefully.
2. Follow the directions as you read the materials.
3. Answer all the questions that you encounter. As you go through the module, you will find help to answer these questions. Sometimes, the answers are found at the end of the module for immediate feedback.
4. To be successful in undertaking this module, you must be patient and industrious in doing the suggested tasks.
5. Take your time to study and learn. **Happy learning!**

The following flowchart serves as your quick guide in using this module.



What to do before (Pretest)

Multiple Choice. Choose the letter of the correct answer.

1. Which of the following is a mathematical phrase?

   a. $x^2 + 1 < 10 - 11$
   b. $3m^2 + 2n - 16 = 0$
   c. $x - 1 > 10$
   d. $x^2 + 4x + 1$

2. Which of the following is NOT an equation?

   a. $P = 21 = 2w$
   b. $x^2 - 1 = 0$
   c. $x^2 - 3x > x - 2$
   d. $x^2 + 7x = -10$

3. Which of the following is a mathematical sentence?

   i. $2(x - 5) > 1$
   ii. $a + 4 = 7 - 2a$

   a. i b. ii c. i and ii d. none of the above

4. Which among the following is NOT an open sentence?

   a. $45n + 7 = 3$
   b. $c - 4 = 0$
   c. $18 > 2$
   d. $-3 \leq -\frac{1}{2}$

5. What is the equivalent mathematical sentence for *"The sum of twice a number and five is equal to thirteen"*?

   a. $2x + 5 = 13$
   b. $2(x + 5) = 13$
   c. $2(5) + x = 13$
   d. $2x = 5 + 13$

6. Translate this verbal sentence into an equation: "Two less than a number is twenty-one.".

   a. $2y = 21$
   b. $2 - y = 21$
   c. $y = 21 - 2$
   d. $y - 2 = 21$

7. Which of the following is equivalent to $5x = 40$?

   a. Five added to a number is forty.
   b. Five decreased by a number is forty.
   c. Five times a number is forty.
   d. The quotient of five and a number is forty.

8. What is a verbal statement for the mathematical sentence $3a - 4 = 7$?

   a. A number subtracted by four is seven.
   b. Twice a number subtracted by four is seven.
   c. Thrice a number subtracted from four is seven.
   d. Thrice a number subtracted by four is seven.

9. The following are first-degree equations in one variable EXCEPT

   a. $x^2 + 4 = 0$
   b. $3x - 4 = 10$
   c. $b + 9 = -3$
   d. $25a = 50$

10. Which of the following is a first-degree equation in one variable?

    a. $1/v^2 - 3 = 4$
    b. $\frac{1}{2} a = n$
    c. $x^2 = 0$
    d. $3n - 5 = r^3$

11. The following symbols are used in a first-degree inequality in one variable EXCEPT

    a. $=$
    b. $<$
    c. $>$
    d. $\leq$

12. Which among the following is a first-degree inequality in one variable?

    i. $d < 5\ (6)$
    ii. $v^3 > 0$

    a. i
    b. ii
    c. i and ii
    d. none of the above

13. What equation represents the distance d traveled by a car at the rate of 60 km/hr in 4 hours?

    a. $d = 60 + 4$
    b. $60 = 4d$
    c. $4 = 60d$
    d. $d = 60\ (4)$

14. The amount of electricity consumed by Mark's family is twice the amount consumed by Joy's family. If Mark's family consumed an amount x of electricity this month, what first-degree equation in one variable will be used to model this situation if the total amount consumed by them is P1050?

a. $x = 1050$
b. $x + 2x = 1050$
c. $2x = 1050$
d. $x = 1050 + 2x$

15. The perimeter p of a square is four times the length of its side s. If the perimeter is 120 cm., what first-degree equation in one variable will relate the given perimeter and the length of the side of the square?

a. $s = 120/4$
b. $4\ (120) = s$
c. $s + 4s = 120$
d. $120 = 4s$

 **Answer Key on page 21**

What you will do

Read the following lessons carefully.

Lesson 1 *Mathematical Phrase, Mathematical Sentence, Equations and Inequalities*

In the previous module, you learned about algebraic expressions. Let us recall its definition.

> **An algebraic expression** is a collection of constants and variables that are combined using one or more of the four fundamental operations namely, addition, subtraction, multiplication and division (except division by zero).

Exploration

Let us now observe some algebraic expressions that are contained in the mathematical phrases and mathematical sentences presented below.

Mathematical Phrases	**Mathematical Sentences**
$20 - 12$	$20 - 12 = 8$
$2b$	$2b = 4$
$x + y$	$7 = x + y$
$5s$	$5s = t$
$3r + 4$	$3 + 4 < 0$
$-7c$	$-7c \leq 1$
$e - 4d$	$e - 4d > \frac{1}{2}$
$2v + w$	$2v + w \geq 9a$

What do you observe? How do you compare a **mathematical phrase** with a **mathematical sentence?** _____

_____

You are correct! A **mathematical phrase** contains an algebraic expression that does **not** express a complete thought. On the other hand, a **mathematical sentence** contains algebraic expressions together with a relation symbol $=$, $<$, $\leq$, $>$ or $\geq$ and it expresses a complete thought. We recall that these relation symbols are read as follows.

$=$	is equal to or equals
$<$	is less than
$\leq$	is less than or equal to
$>$	is greater than
$\geq$	is greater than or equal to

Now, let us look at the given mathematical sentences. The first four mathematical sentences namely, $20 - 12 = 8$, $2b = 4$, $7 = x + y$ and $5s = t$ are called **equations**. Can you give your own examples of equations?

_____

If your answers contain algebraic expressions together with the sign $=$, then you are right.

In your view, what is an equation? _____

_____

Good. An **equation** is a mathematical sentence that makes use of the symbol $=$. What do you think does the symbol $=$ imply? _____

Yes, the symbol = implies that the two sides of the equation are equal. This means that whatever is the value of the left side of the equation is also the value of the right side.

This time, let us focus on the last four mathematical sentences namely, $3 + 4 < 0$, $-7c \leq 1$, $e - 4d > ½$ and $2v + w \geq 9a$. These mathematical sentences are called inequalities. Can you give your own examples of inequalities?

_____

_____

If your examples contain algebraic expressions together with the relation symbols $<$, $\leq$, $>$ or $\geq$, then you are correct.

How do you then define an inequality? _____

_____

Very good. An **inequality** is a mathematical sentence that makes use of the relation symbols $<$, $\leq$, $>$ or $\geq$.

What do the symbols $<$ and $>$ imply? _____

_____ Yes. The symbols $<$ and $>$ imply that the left side of the inequality is not equal to the right side of the inequality. This means further that the symbol $<$ is used when the value of the left side of the inequality is less than the value of the right side, while the symbol $>$ is used when the value of the left side of the inequality is greater than the value of the right side.

The symbol $\leq$ means that the value of the left side of the inequality is either less than or equal to the value of the right side, while the symbol $\geq$ means that the value of the left side of the inequality is either greater than or equal to the value of the right side.

Again, let us go back to each of the given mathematical sentences and tell whether it is true or false.

	Mathematical sentence	True or False?
1.	$20 - 12 = 8$	_____
2.	$2b = 4$	_____
3.	$7 = x + y$	_____
4.	$5s = t$	_____
5.	$3 + 4 < 0$	_____
6.	$-7c \leq 1$	_____
7.	$e - 4d > ½$	_____
8.	$2v + w \geq 9a$	_____

If your answer is *true* for the first mathematical sentence, false for the 5th mathematical sentence, while *may be true or false* or *neither true nor false*, for the remaining mathematical sentences, then you are correct.

Sentences 2, 3 4, 6, 7 and 8 may be true or false depending upon the value/s of the variable/s. For example, in the equation

$2b = 4$

if $b = 2$ then $2(2) = 4$ and the equation is true,

but if $b = -1$ then $2(-1) = 4$ thus, the equation is false.

Sentences 2, 3, 4, 6, 7 and 8 are examples of **open sentences**. An **open sentence** is an equation or inequality that becomes true or false when the variable is replaced by a value.

Let us summarize what you learned in this lesson.

Remember

A **mathematical phrase** is an expression that does **not** express a complete thought.

A **mathematical sentence** is an expression together with a relation symbol $=, <, \leq, >$ or $\geq$. It expresses a complete thought.

A mathematical sentence may be an equation or inequality.

An **equation** is a mathematical sentence that makes use of the symbol $=$.

An **inequality** is a mathematical sentence that makes use of the relation symbols $<, \leq, >$ or $\geq$.

An **open sentence** is an equation or inequality that becomes true or false when the variable is replaced by a value.

Self-check 1

A. Tell whether each of the following is a mathematical phrase or a mathematical sentence.

1. $x + \frac{1}{2} + 2$
2. $3(x - 2) = 2(x + 5)$
3. $y - 5 \leq 7$
4. $y + 1/y$
5. $y^2 + 5y$
6. $2x + 21 \geq 4$
7. $4(c^2 + d^2)$
8. $10 - x$
9. $11 + 5x < 3x - 1$
10. $n - (n+2) = 13$

B. Consider the following mathematical sentences. Classify as true, false or open.

1. One kilometer is equal to 1000 meters.
2. It is the world's largest archipelago.
3. $5 + 9 = 14$
4. $9x + 4 = 20$
5. $15 > 21$

C. Fill in the box with the relation symbol $=, <, \leq, >$ or $\geq$.

1. $3 + 5 \square 9 - 1$
2. $8 \square 2(7 - 3)$
3. $(39 \div 3) + 2 \square 6 + 2(5 - 1)$
4. $x + 6 \square 13$, if x is replaced by 7
5. $2m \square 6 + 9$, if m is 1

Answer Key on page 21

Lesson 2 *Translating Verbal Statements to Equations or Inequalities and vice-versa*

A knowledge of mathematical symbols and their meanings will enable you to translate verbal sentences into mathematical sentences and vice-versa.

Let us study the chart below.

Word/Phrase	Symbol
added to, increased by, more than, the sum of, plus	+
Subtracted from/to, decreased by, diminished by, less than, the difference	-
As much as, of, as many as, product of	( ) or sometimes not written anymore
Divided by, the quotient of, ratio, over	÷, /, $\frac{\quad}{\quad}$
Is equal to, equals, is the same as	=
is less than	<
is less than or equal to, at most	≤
is greater than	>
is greater than or equal to, at least	≥

Now, let us use the phrases and their corresponding symbols given in the chart to translate verbal sentences into equations or inequalities.

Example 1. Translate each of the following into a mathematical sentences.

1.1 verbal sentence: *Three* *times* *a number* *is* *nine.*

translation: 3 · n = 9

mathematical sentence: $3 \cdot n = 9$ or $3n = 9$

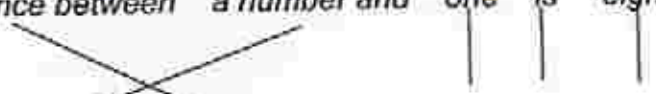
We note that the symbol for the operation multiplication **may not** be written anymore.

1.2 verbal sentence: *The sum of a number and seven is twelve.*

translation: b + 7 = 12

mathematical sentence: $b + 7 = 12$

1.3 verbal sentence: *The difference between a number and one is eight.*



translation: $c - 1 = 8$

mathematical sentence: $c - 1 = 8$

Let us see if you can do the same thing in the following sentences. Write the corresponding symbols below.

1.4 verbal sentence: *A number added to six is greater than two.*

translation: ____ ____ ____ ____ ____

mathematical sentence: _____

If your answer is $x + 6 > 2$, then you are correct.

1.5 verbal sentence: *Twice a number subtracted by nine is less than five.*

translation: ____ ____ ____ ____ ____ ____

mathematical sentence: _____

If your answer is $2x - 9 < 5$, then you got it right.

What if you are to translate a mathematical equation into a verbal sentence? Let us consider the following examples.

Example 2. Translate each mathematical sentence into a verbal sentence.

2.1 mathematical sentence: $xy = 16$

verbal sentence: The product of x and y is sixteen.

We note that the given mathematical sentence may also be translated as "*The product of a number and another number is 16.*" or "*x times y is equal to 16.*"

2.2 mathematical sentence: $a + 4 \geq 7$

verbal sentence: The sum of a number and four is greater than or equal to seven.

Now, let us see if you can translate the given mathematical sentence into a verbal sentence.

2.3 mathematical sentence: $5 - 2y = -3$

verbal sentence: _____

If your answer is "*Five subtracted by twice a number is negative three.*" or "*Two times a number subtracted from five equals negative three.*", then you are correct.

2.4 mathematical sentence: $3(r + 9) < 10$

verbal sentence: _____

If your answer is "*Thrice the sum of a number and 9 is less than ten.*" or "*Three multiplied by the sum of r and nine is less than ten.*", then you are very good. This means that you already know how to translate mathematical sentences into verbal sentences.

Let us have a summary of our discussion.

To **translate a verbal sentence into a mathematical sentence**, we use a symbol that corresponds to every word or phrase in the given verbal sentence until the mathematical sentence is formed

To **translate a mathematical sentence into a verbal sentence**, we use a word or a phrase to that corresponds to every symbol in the given mathematical sentence until the thought of the verbal sentence is obtained.

Self-check 2

A. Translate each verbal sentence into a mathematical sentence.

1. A number added to six is equal to two.
2. A number minus 16 is equal to 38.
3. The difference between 4*a* and 7 is less than 6.
4. Seven times the sum of 8 and *a* is grater than or equal to 10.
5. Six times a number *y* less than four is equal to eight.

B. Translate the given mathematical sentence into a verbal sentence.

1. $2x + 5 = 9$
2. $9 + 3x = 18$
3. $2x - 16 \leq 4$
4. $2(x + 1) = 8$
5. $4m - 3 \geq 16$

Answer Key on page 21

Lesson 3 *Differentiating First-degree Equations from First-degree Inequalities in One Variable*

In lesson 1, you learned the difference between an equation and inequality. Let us study the following.

The equations below are **first-degree equations in one variable**.

$x = 1$ $\quad 5b = 4$ $\quad 2a + 7 = 0$ $\quad 6c - 5 = -2$ $\quad 7 + 8y = 2$

The equations below are **not** first-degree equations in one variable.

$y^2 = 1$ $\quad 5b - r = 14$ $\quad 2a + 7b^3 = 0$ $\quad 6c^4 - 5 = -2$ $\quad 8y = 2x$

Which of the following equations are first-degree equations in one variable?

$x + 8 = 15$ $z^3 = 0$ $3a + 6h = ½$ $5r - 1 = 4$ $t = -7$

Compare your answers with mine. $x + 8 = 15$, $5r - 1 = 4$ and $t = -7$
Did you get the correct answers? Good!

How do you define a **first-degree equation in one variable?** _____

_____

You are right. A **first-degree equation in one variable** is an equation that contains only one variable and the variable is raised to exponent 1. Thus, a first-degree equation in x is of the form $ax + b = 0$ where a is a nonzero real number and b is any real number.

Can you give your own examples of first-degree equations in one variable? _____

If your examples are equations that contain only one variable and the variable is raised to exponent one, then you are right.

Now, let us consider the first set of first-degree equations in one variable that are given above.

$x = 1$ $5b = 4$ $2a + 7 = 0$ $6c - 5 = -2$ $7 + 8y = 2$

If the symbol = is changed to any of the following relation symbols, $<$, $\leq$, $>$ or $\geq$, then we have **first-degree inequalities in one variable**. Some possible results are as follows.

$x < 1$ $5b > 4$ $2a + 7 \leq 0$ $6c - 5 \geq -2$ $7 + 8y < 2$

What is a first-degree inequality in one variable? _____

_____

Correct. A first-degree inequality in one variable is an inequality that contains only one variable and the variable is raised to exponent 1.

A first-degree inequality in x is of the following forms:

$$ax + b < 0$$
$$ax + b \leq 0$$
$$ax + b > 0$$
$$ax + b \geq 0$$

where a is a nonzero real number and b is any real number.

Give your own examples of a first-degree inequality in one variable?

_____

If your examples are of the forms as stated above, then you are correct.

Let us have a summary of our discussion.

A **first-degree equation in one variable** is an equation that contains only **one variable** and the variable is raised to **exponent 1.**

A **first-degree equation in *x*** is of the form

$ax + b = 0$ where a is a nonzero constant and b is any real number.

A **first-degree inequality in one variable** is an inequality that contains only **one variable** and the variable is raised to **exponent 1.**

A **first-degree inequality in *x*** is of the following forms:

$ax + b < 0$
$ax + b \leq 0$ where a is a nonzero real number and b is any real number.
$ax + b > 0$
$ax + b \geq 0$

Self-check 3

Determine whether each of the following is an example of a first-degree equation or a first-degree inequality in one variable. Explain your answer.

1. $x + 1 = 0$
2. $9/y^2 = 3$
3. $4a^2 + 4a + 1 > 0$
4. $m + n = 25$
5. $9 = 3c$

Lesson 4 *Applications of Equations and Inequalities*

Equations and inequalities are used to model some real-life situations. This is successfully done by using your knowledge in translating a verbal sentence into an equation or inequality.

Let us study the following examples.

1. In 1994, twice the population of a barangay n in Cavite is 50 000. This is modeled by an equation that is obtained by translating the verbal sentence "*Twice n is 50 000.*" into an equation. Thus, we have $2n = 50\,000$.

2. The distance d that a vehicle travels is computed by multiplying the rate r by the time t it consumes. In symbols, this is written as $d = rt$. What equation represents the time consumed by a plane in traveling a distance of 1,468 miles at the rate of 400 mi/hr.? _____

   Correct. The equation is $1468 = 400t$.

3. Patrick is 4 inches taller than Manny. The sum of their heights is less than 7 feet. Represent this by a first-degree inequality in one variable. _____

   If you use the variable p for Patrick's height, then Manny's height is $p + 4$. (You can also use other variables.) Thus, your final answer must be $p + p + 4 < 7$.

4. The amount earned by John is three times the amount earned by Armand. What first-degree inequality in one variable will be used to model the situation if you use the variable a to represent the amount earned by Armand and their total earnings is at least P28,000? _____

   You should have represented the amount earned by John as $3a$ and your final answer must be $a + 3a \geq 28000$.

5. Connie's age is half of Ian's age. Suppose Ian's age is represented by i. What first-degree equation in one variable will represent the verbal sentence "Ten years from now, their total ages will be 54." ? _____

   Let us check your answer. You should have used ½ i for Connie's age. Ten years from now, Ian's and Connie's ages should be represented by $i + 10$ and $\frac{1}{2}i + 10$ respectively. Why? _____

Let us check your answer. You should have used ½ i for Connie's age. Ten years from now, Ian's and Connie's ages should be represented by $i + 10$ and $\frac{1}{2} i + 10$ respectively. Why? _____

Yes, ten years from now is translated as + 10. Thus, your equation must be $i + 10 + \frac{1}{2} i + 10 = 54$.

Let us summarize what you learned in this lesson.

> Some real-life situations are modeled by equations or inequalities. To do this, we **translate the verbal sentence into an equation or inequality**.

Self-check 4

Read the following situations and do what is required.

1. Tom's weight is 2 lbs less than the weight w of Cherry. Write a first-degree equation in one variable that represents the sentence "The sum of Tom's and Cherry's weights is 210 lbs."

2. The perimeter p of a rectangle with length l and width w is given by the formula $p = 2l + 2w$. The length of the top of a rectangular table is 1 m more than its width. What is the first-degree equation in one variable that relates the perimeter and width of the top of that table if the perimeter is 6 m?

3. Jenny sold 20 more magazines than Chris. If you use the variable c to represent the number of magazines sold by Chris, what first-degree equation in one variable represents the sentence "Five times the total number of magazines sold by Jenny and Chris is ten more than seven times the number of magazines sold by Jenny."?

4. The number of P10 coins is 17 decreased by the number of P5 coins. If the variable f is used to represent the number of P5 coins, how will you represent the following:

   4.1 number of P10 coins in terms of f
   4.2 value of P5 coins

4.3 value of P10 coins
4.4 first degree mathematical sentence in one variable for "The value of all coins is at most P110."

5. Let d be the distance ran by Henry. Diego ran a third as far as Henry. Write the first-degree equation that models the statement "The distance ran by Henry is four times the distance ran by Diego.".

Answer Key on page 22

What to do after (Posttest)

Multiple Choice. Choose the letter of the correct answer.

1. Which of the following is a mathematical sentence?

a. $x^2 + 6x + 9$
b. $y + 1/y < 5$
c. $x - 9$
d. $x^2 + 4x + 4$

2. The following are inequalities EXCEPT

a. $2x - 5 > x + 2$
b. $3n^2 + 5n - 2 < 3n + 4$
c. $3x + 5 < 2x - 7$
d. $x^2 - x = 2$

3. The following are open sentences EXCEPT?

a. She is the first woman president in the Philippines.
b. x is a counting number divisible by five.
c. The Philippines is composed of 10 regions.
d. $x^2 + 5x + 4 = 0$

4. Which of the following is an equation?

a. $5 + 7$
b. $2x - y$
c. $x > y$
d. $6 = a$

5. What is an equivalent verbal statement for "$2(x + y) - 5 \geq 12$".

d. Twice x plus y minus five is greater than or equal to twelve.

6. Which of the following is a verbal sentence for the inequality $3x \geq 12$?

a. Three times a number is greater than twelve.
b. Thrice a number multiplied by three is greater than or equal to twelve.
c. Thrice a number is at least twelve.
d. Three times a number is at most twelve.

7. What is the mathematical sentence for "A number diminished by eight is thirteen."?

a. $x - 8 = 13$
b. $8 - x = 13$
c. $x + 8 = 13$
d. $x - 8 > 13$

8. Which of the following is the mathematical sentence for the verbal sentence "The product of a number n and sixteen added to another number m is 50."?

a. $n + 16 + m = 50$
b. $16n + m = 50$
c. $n + 16m = 50$
d. $16nm = 50$

9. Which of the following is used as a symbol to represent a first-degree equation in one variable?

a. $=$ b. $<$ c. $\leq$ d. $>$

10. The following are first-degree inequalities in one variable EXCEPT

a. $x^2 - 4x > 2x - 5$
b. $3x - 2 < x + 7$
c. $3 > -5x + 2$
d. $7x - 10 \geq 5x - 1$

11. If a is any nonzero real number and b is any real number, which of the following represents a first-degree equation in x?

a. $ax + b = 0$
b. $ax + by = 0$
c. $ax^2 + b = 0$
d. $ax + b > 0$

12. Which of the following is a first-degree equation in one variable?

i. $v - 3 = 15$
ii. $v^2 = 100$
iii. $6 = 12 - v$

a. i only b. ii only c. i and ii d. i and iii

13. What equation represents the distance d traveled by a bus at the rate of 80 kph in 2 hours?

a. $d = 80\ (2)$
b. $80 = 2d$
c. $2 = 80d$
d. $d = 80 + 2$

14. The number of P100-bills is 4 more than thrice the number of P50-bills. If there are x-P50 bills, what first-degree equation in one variable will represent the sentence "The total number of bills is 28".?

a. $x + 4 + 3x = 28$
b. $28 = 4 + 3x$
c. $x = 28$
d. $x + 4 + x = 28$

15. If Celia's age at present is represented by c, what first-degree equation in one variable will represent "Celia's age 15 years from now is 23 less than twice her age at present."?

a. $c = 2c - 23$
b. $-15 = 2c - 23$
c. $c + 15 = 2c - 23$
d. $15 + c = 23 - 2c$

Answer Key on page 22

Answer Key

Pretest page 3

1. d	6. d	11. a
2. c	7. c	12. a
3. c	8. d	13. d
4. c	9. a	14. b
5. a	10. b	15. d

Lesson 1 *Self-check 1* page 9

A. 1. mathematical phrase
2. mathematical sentence
3. mathematical sentence
4. mathematical phrase
5. mathematical phrase
6. mathematical sentence
7. mathematical phrase
8. mathematical phrase
9. mathematical sentence
10. mathematical sentence

B. 1. true 2. open 3. true 4. open 5. false

C. 1. = 2. = 3. > 4. = 5. <

Lesson 2 *Self-check 3* page 13

A. 1. $n = 6 = 2$
2. $y - 16 = 38$
3. $4a - 7 < 6$
4. $7(8 + a) \geq 10$
5. $4 - 6y = 8$

B. 1. The sum of twice a number and five is nine.
2. The sum of nine and thrice a number is eighteen.
3. Sixteen less than twice a number is less than or equal to four.
4. Twice the sum of a number and one is eight.
5. Four times a number subtracted by three is at least 16.

Lesson 3 *Self-check 3* page 15

1. first-degree equation in one variable; there is only one variable raised to exponent 1
2. not a first-degree equation in one variable; the exponent of the variable is not 1
3. not a first-degree equation in one variable; the exponent of the variable is not 1
4. not a first-degree equation in one variable; there are 2 variables
5. first-degree equation in one variable; there is only one variable raised to exponent 1

Lesson 4 *Self-check 4* page 17

1. $w - 2 + w = 210$
2. $6 = 2(1 + w) + w$
3. $5(c + c + 20) = 8(c + 20)$
4. 4.1 $5f$ 4.2 $17 - f$ 4.3 $10(17-f)$ 4.4 $5f + 10(17 - f) \leq 140$
5. $4d \leq 2(1/3)\, d$

Posttest page 18

1. b	6. c	11. a
2. d	7. a	12. d
3. c	8. b	13. a
4. d	9. a	14. a
5. d	10. a	15. c

END OF MODULE