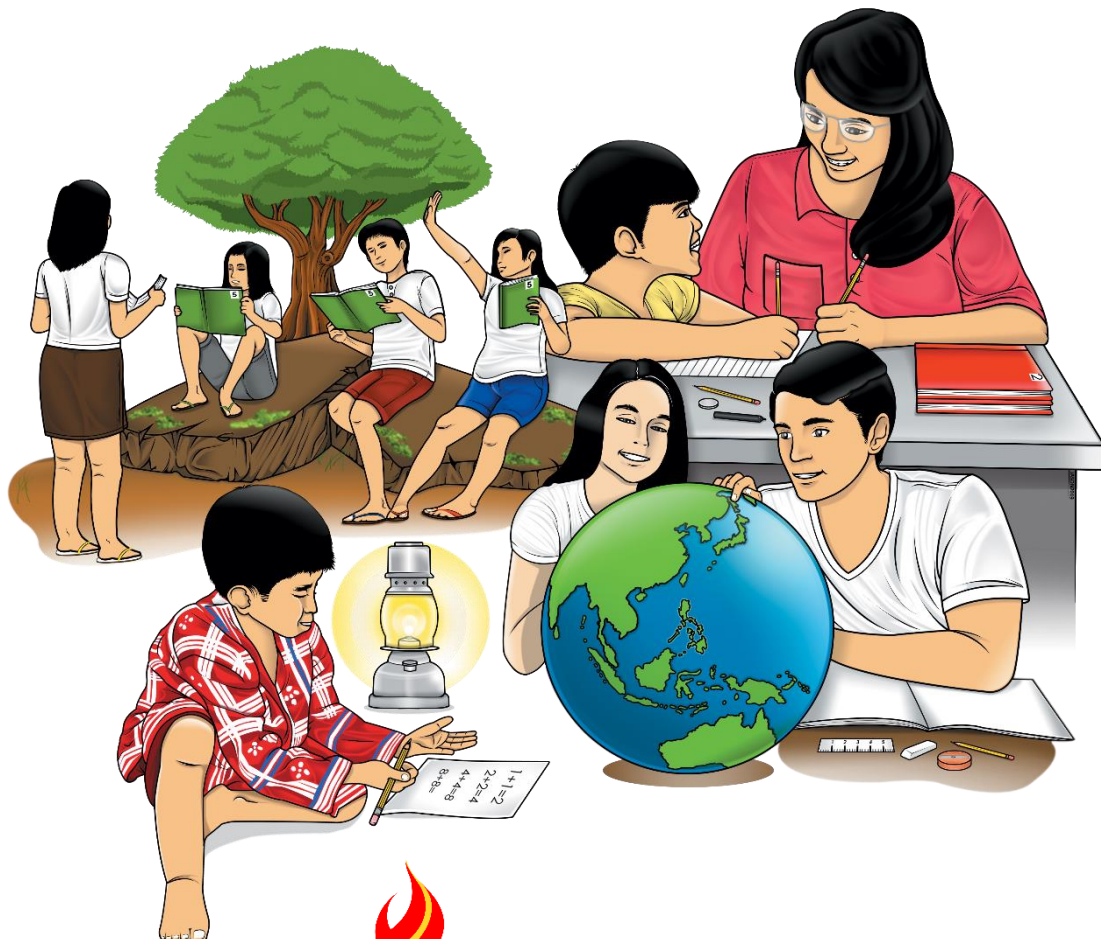


# Mathematics

## Quarter 3 – Module 3:

### Giving Translation of Real-Life Verbal Expressions and Equations Into Letters or Symbols and Vice Versa



**Mathematics – Grade 6**

**Alternative Delivery Mode**

**Quarter 3 – Module 3: Giving translation of real-life verbal expressions and equations into letters and symbols**

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# **Mathematics**

## **Quarter 3 – Module 3:**

### **Giving Translation of Real-Life Verbal Expressions and Equations Into Letters or Symbols and Vice Versa**

## **Introductory Message**

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.



## ***What I Need to Know***

This module was designed and written with you in mind. It is here to help you master the skills in translating real-life verbal expressions and equations into letters or symbols and vice versa. The scope of this module allows you to use it in many different learning situations. The language used recognizes your diverse vocabulary level. The lessons are arranged to follow the standard sequence of your course. But the order in which you read them can be changed to match with the textbook you are now using.

The module is divided into two lessons, namely:

- Lesson 1 – Translating real-life verbal expressions and equations into letters or symbols and vice versa
- Lesson 2 –Identifying a variable in an algebraic expression and equation

After going through this module, you are expected to:

1. Translate real-life verbal expressions and equations into letters or symbols and vice versa (M6AL-IIIe-16) and
2. Identify a variable in an algebraic expression and equation (M6AL-IIIe-17)



## ***What I Know***

Translate the following word phrases into algebraic expressions.

1. Seven more than  $k$
2. Five added to  $q$
3. Three subtracted from  $m$
4.  $c$  increased by 12
5. Twice  $n$

Translate the following algebraic expressions into word phrases.

6.  $14 - 9m$
7.  $r - 4$
8.  $s \div 8$
9.  $2 + (3 \times 5)$
10.  $3n + 5$

## Lesson

# 1

## Translating Real-life Verbal Expressions and Equations into Letters and Symbols and Vice Versa

In the previous lessons you have learned how to differentiate expression from equation. This time we will focus on translating real-life verbal expressions and equations into letters and vice versa.



### ***What's In***

Translate the following algebraic expressions into word phrases. Write your answer in your answer sheet.

1.  $2m + n$
2.  $3x - 7$
3.  $5 + (2x)$
4.  $2(a + b)$
5.  $6x \div 2$
6.  $n + 2m$



### ***Notes to the Teacher***

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



## What's New

Read and understand the problem below.

Mr. and Mrs. Romeo own a laundry shop. They have 152 customers this week, 24 fewer than last week. Write an algebraic equation for the number of customers they had last week.



## What is It

To translate the given problem into algebraic equation, consider this:

Let  $m$  be the number they had last week.

Translation:

|                                             |    |     |
|---------------------------------------------|----|-----|
| Twenty-four fewer than the number last week | is | 152 |
| $m - 24$                                    | =  | 152 |

Algebraic equation:  $m - 24 = 152$  (*The number of costumers last week is 24 fewer than  $m$  is 152*)

Example 2:

A kite is flying at an altitude of  $m$  meters. Express algebraically its new altitude after rising 20 meters.

Translate:

|           |                 |    |
|-----------|-----------------|----|
| $m$ meter | is increased by | 20 |
| $m$       | +               | 20 |

Algebraic expression:  $m + 20$  (*The kite's new altitude is 20 meters more than  $m$  meters*)

**Example 3** Translate into an algebraic equation: Twice a number decreased by eight is equal to 16.

Let  $k$  be the number.

|                |              |       |             |         |
|----------------|--------------|-------|-------------|---------|
| Twice a number | decreased by | eight | is equal to | sixteen |
| $2k$           | -            | 8     | =           | 16      |

Algebraic equation:  $2k - 8 = 16$

**Example 4** Translate into an algebraic equation: If fourteen is added to the difference of a number and 23, the sum is eighty.

Let  $z$  be the number.

|                               |      |          |    |        |
|-------------------------------|------|----------|----|--------|
| difference of a number and 23 | plus | fourteen | is | eighty |
| $z - 23$                      | +    | 14       | =  | 80     |

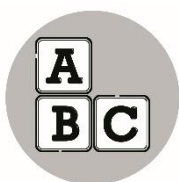
Algebraic equation:  $z - 23 + 14 = 80$

**Example 5** Translate into an algebraic equation. Thrice the sum of a number and four is thirty-two.

Let  $w$  be the number.

|        |                              |    |            |
|--------|------------------------------|----|------------|
| thrice | the sum of a number and four | is | thirty-two |
| 3      | $w + 4$                      | =  | 32         |

Algebraic equation:  $3 ( w + 4 ) = 32$



## What's More

A. Translate the following numerical expressions/equations into word phrases.

| Numerical Expressions/Equations | Translations |
|---------------------------------|--------------|
| 1. $25 + y$                     |              |
| 2. $5n = 120$                   |              |
| 3. $45k$                        |              |
| 4. $2r + 4 = 20$                |              |
| 5. $t \div 6 = 130$             |              |

B. Translate the following into numerical expression / equation. Write your answers on your answer sheet.

1. Twice the sum of 8 and  $r$

Translation: \_\_\_\_\_

2. Mike weighs  $r$  pounds. Translate algebraically his weight after he gained 5 pounds.

Translation: \_\_\_\_\_

3. Billy is  $z$  years old now. Express his age 8 years ago.

Translation: \_\_\_\_\_

Refer inside the box for items 4-5.

Marivic is thrice as old as Roselyn. If Roselyn is  $m$  years old, Kris is 3 years older than Roselyn.

4. Express Kris' age algebraically

Translation: \_\_\_\_\_

5. Write the expression for the sum of Marivic's and Roselyn's ages.

Translation: \_\_\_\_\_



## ***What I Have Learned***

To translate verbal expressions and equations into letters or symbols and vice versa, familiarity with words and phrases associated with symbols or operations are very important.

These are key words that might be useful in translating word phrase to mathematical symbols.

| Symbols   | Meaning/s                                                                                                                   |
|-----------|-----------------------------------------------------------------------------------------------------------------------------|
| +         | addition, plus, the sum of, more than, added to, increased by, the total of                                                 |
| -         | subtraction, minus, the difference of, less than, decreased by, diminished by, subtracted from, less, take away, fewer than |
| x, •, ( ) | multiplication, times, the product of, of, twice, multiplied by, thrice                                                     |
| ÷, /, —   | division, divided by, the quotient of, the ratio of, per                                                                    |
| =         | equals, is equal to, is, is the same as                                                                                     |



## ***What I Can Do***

Read and translate the following word problems into algebraic equations.

Write your answer in your answer sheet.

1. Jose is  $p$  centimeters tall. Ben's height is thrice Jose's height. Express Ben's height algebraically.
2. Write an algebraic equation for the cost of 15 liters of gasoline, if  $x$  pesos per liter is ₱810.00.
3. Noel is  $y$  years old now. Write the algebraic equation for Noel's age if his age 10 years from now is 35.
4. Ten years ago, Art was four times as old as Ken. Write the algebraic equation showing Art's age.
5. If twice a number is increased by 15, the result is 45. Write the algebraic equation of the given statement.



## Assessment

Match the word phrases in column A with the numerical expressions /equations in column B. Write the letter of the correct answer in your answer sheet.

A

1. a number  $b$  subtracted from 12
2. six times the number  $y$
3. the sum of five and thrice a number  $z$
4. twelve divided by  $n$
5. one less than the product of 4 and  $y$
6. a number  $z$  increased by ten
7. twice the square of a number  $x$
8. thrice the product of 4 and  $r$
9. nine times a number  $k$
10. six times a number  $x$  minus five

B

- a.  $6y$
- b.  $2x^2$
- c.  $5 + 3z$
- d.  $6x - 5$
- e.  $9k$
- f.  $z + 10$
- g.  $3(4r)$
- h.  $4y - 1$
- i.  $12 - b$
- j.  $12 \div n$



## ***Additional Activities***

A. Translate the following verbal phrases into algebraic expressions or equations:

1. five subtracted from twice  $z$
2. a number  $p$  less eleven is fifty
3. fifteen decreased by a number  $p$
4. the square of the product of  $x$  and  $y$
5. the sum of six and twenty less five equals the number  $z$

B. Translate the following numerical expressions/equations into word phrases:

1.  $2x + 5$
2.  $5x - 8$
3.  $4(y + 7)$
4.  $2n = 120$
5.  $4^2 = 16$



## Answer Key

| What I Know                                               |                                                         | What's In                                                                             |                                                                                                                   | What I Can Do |                                                                                                        | What's More |                                                                                                             |
|-----------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------|
| 1. $k+7$                                                  | 2. $5+q / q+5$                                          | 3. $m-3$                                                                              | 4. $c+12$                                                                                                         | 5. $2n$       | (for items 6-10, learner may use other related words/phrases associated with the indicated operations) |             | 6. Fourteen decreased by the product of nine and a number /<br>Fourteen minus the product of 9 and a number |
| 7. A number diminished by four /<br>A number minus four / | 8. Four is subtracted from a number<br>s divided by 8 / | 9. The quotient of a number and eight<br>the product of three and five added to two / | 10. two plus the product of three and five<br>three times n added to five /<br>three multiplied to five plus five |               |                                                                                                        |             |                                                                                                             |
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## Lesson 2

# Identifying a Variable in an Algebraic Expression and Equation

In the previous lessons you have learned to translate real-life verbal expressions and equations into letters and vice versa. This time, we will focus on identifying a variable in an algebraic expression and equation.



### ***What's In***

A. Identify the number that should replace the question mark to make the mathematical statement correct. Write your answers on your answer sheet.

1.  $? + 5 = 22$
2.  $72 \div ? = 8$
3.  $19 = ? - 12$
4.  $7 + 2 = 3 + ?$
5.  $21 \times ? = 63$

B. Translate the following word phrases into algebraic expression and identify the variable(s). Write your answer on your answer sheet.

6. Five times the sum of a and b
7. Twelve decreased by twice x
8. Fifty-one minus the product of r and five
9. Seven is multiplied to the difference of two and x
10. The quotient of twelve and four added to x



## ***What's New***

Read and analyze the problem.

Leni bought 5 apples which cost ₱12.00 each. She gave the seller a ₱100.00 bill. How much change did Leni receive?

1. What did Leni buy?
2. How much did she give to the seller?
3. What do you need to find out?
4. What is used to represent unknown number?



## ***What is It***

To solve a mathematical problem, the variable is used to represent unknown number. A variable is any letter or symbol that represents a number.

To solve the above problem, let us use variables to represent the unknown numbers.

Let:  $y$  = be the cost of apples

$z$  = be the change that Leni received from her ₱100.00 bill

To find the cost of apples, we use this equation:  $5 \times \text{₱}12.00 = y$

$$\text{Solution: } 5 \times \text{₱}12.00 = y$$

$$\text{₱}60.00 = y$$

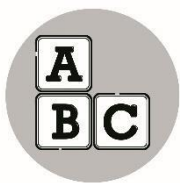
To find the change Leni received, we use this equation:

$$\text{₱}100.00 - \text{₱}60.00 = z$$

$$\text{Solution: } \text{₱}100.00 - \text{₱}60.00 = z$$

$$\text{₱}40.00 = z$$

Therefore, Leni received ₱40.00 change from her ₱100.00 bill.



## ***What's More***

Identify the variable/s in the expressions and equations below. Write your answer on your answer sheet.

1.  $15 - (a + 6)$

2.  $25 \div n = 5$

3.  $c = 48$

4.  $37 - m = 29$

5.  $z = 24 - 18$

6.  $15x^3$

7.  $29 + p = 31$

8.  $b - 30 \div 10$

9.  $24s + 9 = 57$

10.  $(16 \div 4) - 3 = x$



## ***What I Have Learned***

An algebraic expression is a mathematical phrase that uses variables, numerals, and operation symbols.

Any letter or symbol used to represent a number in an algebraic expression or equation is called a variable.



## ***What I Can Do***

Translate the following word phrases into an algebraic expression or equation. Use a variable to represent an unknown number. Write your answer on your answer sheet.

1. fifteen is subtracted from the quotient of a and b.
2. a number diminished by seven
3. four greater than two times a number is equal to sixty.
4. the sum of a number and six is forty.
5. thrice a number decreased by twenty
6. the square of a number is sixteen
7. the quotient of twice a number and five
8. twice a number increased by five is thirty-seven
9. a number divided by two
10. the difference between ten times a number and twelve



## ***Assessment***

Write the variables used in each item below. Write the correct answer in your answer sheet.

1.  $37 - (3 + y)$
2.  $5(4 - b)$
3.  $y = 2 + 46$
4.  $n = 24 \times 2$
5.  $z \times 9 = 90 \div 10$
6. forty divided by  $p$
7.  $r$  less than a product of two and eight
8. eighteen less than  $x$
9.  $q$  less than the product of six and for is eighteen
10. the sum of  $t$  and fifty-seven is sixty-five



## ***Additional Activities***

Translate the following word phrases into algebraic expression or equation. Use variables to represent unknown numbers. Write your answer on your answer sheet.

1. a number less than a quotient of seventy-five and fifteen
2. sixty-four reduced by a number is forty-eight
3. the sum of a number and twelve is 26
4. seventeen added to a number
5. twenty-one added to a number
6.  $n$  decreased by three
7. eighteen less than a number
8. a number less than three times fifteen
9. five times a number less three is eighteen.
10. a number added to ninety is five hundred two



## Answer Key

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                         |
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| <p><b>Additional Activities</b></p> <ol style="list-style-type: none"> <li><math>n - (75 \div 15)</math></li> <li><math>64 - n = 48</math></li> <li><math>n + 12 = 26</math></li> <li><math>17 + n / n + 17</math></li> <li><math>21 + n / n + 21</math></li> <li><math>n - 3</math></li> <li><math>n - 18</math></li> <li><math>n - 3(15)</math></li> <li><math>5n - 3 = 18</math></li> <li><math>n + 90 = 502 / 90 + n = 502</math></li> </ol> <p><i>Note: learners may use any letters or symbols to represent variables</i></p> | <p><b>What's More</b></p> <ol style="list-style-type: none"> <li>a</li> <li>n</li> <li>c</li> <li>m</li> <li>z</li> <li>x</li> <li>p</li> <li>b</li> <li>s</li> <li>x</li> </ol>                                                                                                                                                                                        |
| <p><b>Assessment</b></p> <ol style="list-style-type: none"> <li>y</li> <li>b</li> <li>y</li> <li>n</li> <li>z</li> <li>p</li> <li>r</li> <li>x</li> <li>q</li> <li>t</li> </ol>                                                                                                                                                                                                                                                                                                                                                     | <p><b>What's In</b></p> <ol style="list-style-type: none"> <li>17</li> <li>9</li> <li>31</li> <li>6</li> <li>3</li> <li><math>5(a+b)</math> variables are a &amp; b</li> <li><math>12 - 2x</math> variable is x</li> <li><math>51 - (5r)</math> variable is r</li> <li><math>7(2-x)</math> variable is x</li> <li><math>(12 \div 4) + x</math> variable is x</li> </ol> |
| <p><b>What I Can Do</b></p> <ol style="list-style-type: none"> <li><math>(a \div b) - 15</math></li> <li><math>n - 7</math></li> <li><math>2n + 4 = 60</math></li> <li><math>n + 6 = 40</math></li> <li><math>3y - 20</math></li> <li><math>x^2 = 16</math></li> <li><math>2y \div 5</math></li> <li><math>2x + 5 = 37</math></li> <li><math>y \div 2</math></li> <li><math>10n - 12</math></li> </ol> <p>(learners may use any letter or symbol to represent variables)</p>                                                        | <p><b>What I Know</b></p> <ol style="list-style-type: none"> <li>n</li> <li>x</li> <li>n</li> <li>n</li> <li>n</li> <li>p</li> <li>n</li> <li>xy</li> <li>n</li> <li>a</li> </ol>                                                                                                                                                                                       |

## ***References***

Most Essential Learning Competencies (MELC) in Mathematics 6

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