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Mathematics

Quarter 2 – Module 5: "Illustrating and Verifying a Relation and a Function"

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Mathematics

Quarter 2 – Module 5:
"Illustrating and Verifying a Relation and a Function"

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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

In this module, you will be acquainted with relation and function which will help you know how a quantity be related to another quantity, and verify if a relation is a function. The scope of this module enables you to use it in many different learning situations. The lesson is 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- Relations and Functions

After going through this module, you are expected to:

1. illustrate a relation and a function;
2. verify if a given relation is a function;
3. relate functions to real-life situations.

What I Know

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

1. Which of the following statements is true?
   A. Every relation is a function.
   B. Every function is a relation.
   C. Not all functions are relations.
   D. All functions are not relations.

2. Which of the following relations is a function?
   A. {(Mickey, mouse), (Bugs, Bunny), (Cosmo, Wanda)}
   B. {(notebook, pen), (paper, pen), (pen, paper), (pen, notebook)}
   C. {(January,1), (February,1), (March,1), (January,2), (February,2)}
   D. {(trashcan, trash), (broom case, broomstick), (broom case, dustpan)}

3. In how many point(s) does a vertical line intersect the graph of a function?
   A. at least one point
   B. at exactly one point
   C. more than one point
   D. at exactly two points

4. Which of the following is an example of a one-to-one relation?
   A. {(1, 1), (1, -1), (2, 2), (2, -2), (3, 3), (3, -3)}
   B. {(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (1, 7)}
   C. {(q, 3), (r,3), (s, 5), (t,4), (u, 4), (v, 4), (w,5), (x, 5)}
   D. {(a, p), (b, q), (c, r), (d, s), (e, t), (f, u), (g, w), (h, x)}

5. Which of the following table of values shows a relation that is a function.

A.

x	1	2	3	4	5
y	-4	-2	0	2	4

C.

x	1	1	2	2	3
y	-4	-2	0	2	4

B.

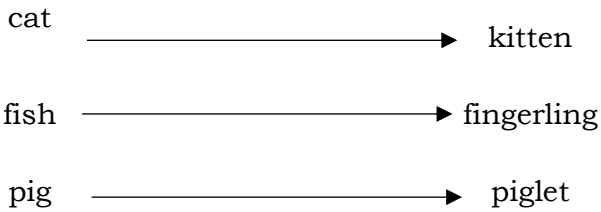
x	-2	-2	-1	-1	0
y	2	-1	1	-2	0

D.

x	-4	-2	-2	0	4
y	-2	-2	-2	-2	-2

For item numbers 6 – 9. Given

I.



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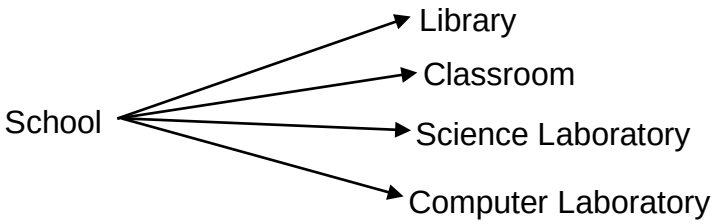

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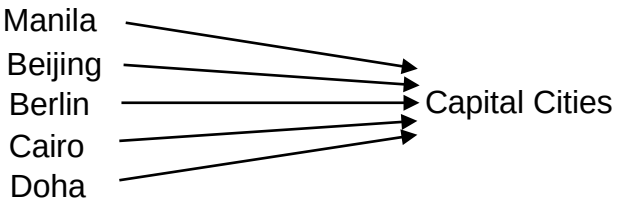

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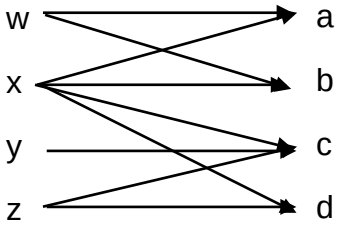


6. Which are examples of mere relation?

A. I & II B. II & III C. III & IV D. II & IV

7. Which are examples of one-to-many relation?

A. I B. II C. III D. IV

8. Which shows a many-to-one relation?

A. I B. II C. III D. IV

9. Which is/ are example/s of a function?

A. I only B. I & III C. III & II D. IV only

10. Relations can be presented on the following EXCEPT.

A. Graph B. Rule C. Shape D. Table

11. Which of the following set of ordered pairs shows one-to-one relation?

A. {(1, 2), (1, 3), (1, 4)}
B. {(1, 2), (3, 4), (3, -3)}
C. {(1, -1), (2, -2), (3, -3)}
D. {(1, -1), (1, -2), (1, -3)}

12. Maria, a Grade 8 student loves to share snacks to her closest friends as shown through these pairs: {(Ana, sandwich), (Juan, sandwich), (Peter, sandwich)}, which of the following correspondence best describes the given set?

A. Many-to-Many
B. One-to-Many
C. Many-to-One
D. One-to-One

13. Given the function f(x) = $7x - 3$, what is f(0)?

A. -3 B. 0 C. 4 D. 7

14. A boy rents a computer at an internet cafe. He has to pay a fixed amount of $P10$ and an additional cost of $P15$ per hour or a fraction of an hour, thereafter. What is the correct mathematical model of the situation?

A. f(x) = 15x + 10
B. f(x) = 15x – 10
C. f(x) = 10x + 15
D. f(x) = 10x – 15

15. Determine which rule below represents a function.

A. $y = \pm\frac{\sqrt{3x^2}}{4} + 9$
B. $x + y = 10$
C. $y^4 = -2x - 7$
D. $2x^2 + y^2 = 8$

Lesson 1 Relations and Functions

There are many occurrences in real life that can be better understood by observing how one quantity behaves in relation to other quantities. Let us begin this module by thinking how two things or quantities relate to each other. What relation can be drawn between quantities?

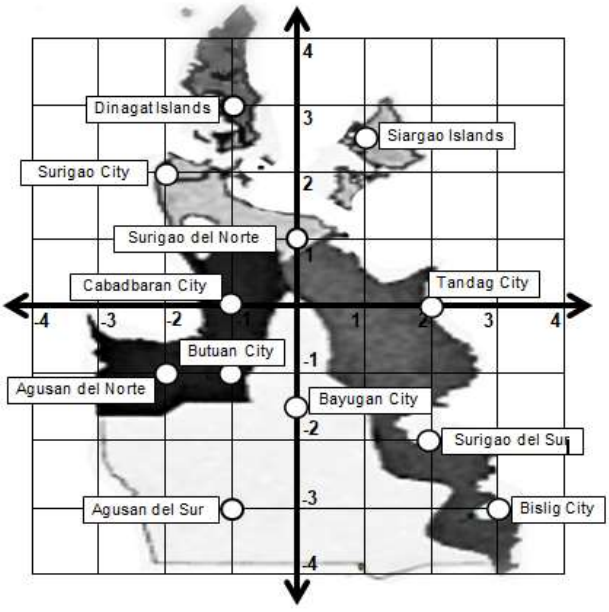
What's In

Activity 1: Wow Caraga!

Directions: Recall the previous lesson about locating the places of Caraga Region. Identify the coordinates where the specific place is located on the map. Write the ordered pairs on the separate sheet of paper.

Example: Agusan del Norte
Answer: (-2, -1)

1. Agusan del Sur (__, __)
2. Bayugan City (__, __)
3. Bislig City (__, __)
4. Butuan City (__, __)
5. Cabadbaran City (__, __)
6. Dinagat Islands (__, __)
7. Siargao Islands (__, __)
8. Surigao del Norte (__, __)
9. Surigao del Sur (___, ___)
10. Tandag City (__, __)



Have you encountered any difficulty in doing the activity? If yes, what is it?

What's New

The coordinates of the points that you identified in the previous exercise are ordered pairs that show the distances (horizontal, vertical) of any point from the point of origin (0,0).

Activity: Let's Connect!

Directions: Use an arrow to connect each quantity in Set A to the corresponding quantity in Set B. Answer the questions that follow.

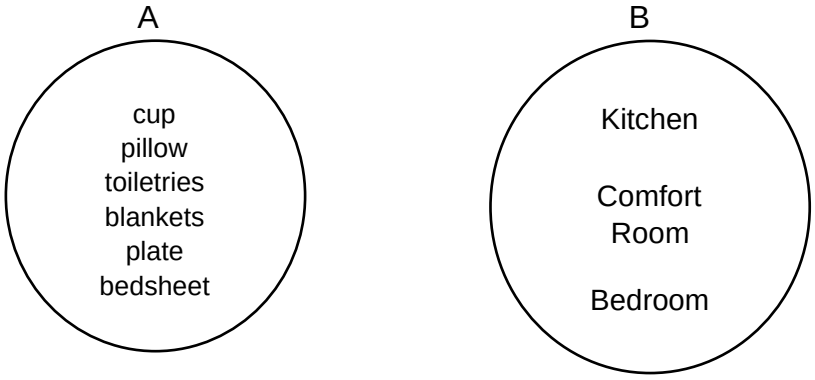
1. Mr. Reyes is a dealer of poultry eggs. He sells them at Php 210 per tray for large size of eggs. The following are the cost for each number of trays.

A	B
(No. of Trays)	(Cost in Php)
1	210
2	420
3	630
4	840
5	1,050

   a. How is the cost related to the number of trays?

   b. How many quantities in A relate to each quantity in B?

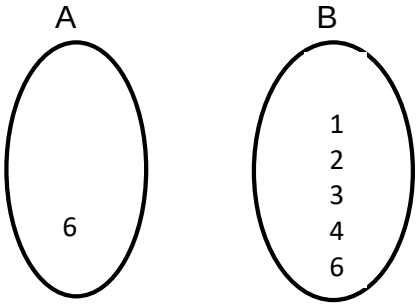
2. Beverly is cleaning the house. Help her to complete the task by drawing an arrow from Set A to Set B.



   a. How the quantities in Set A are related to the quantities in B?

   b. How many quantities in A relate to each quantity in B?

3. Given a number 6 in Set A, which are its factors in Set B?

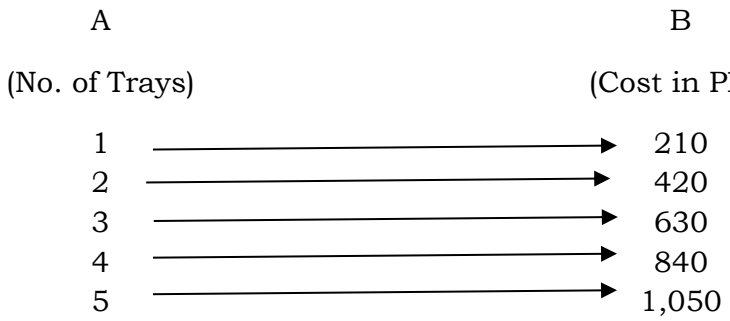


a. How do you relate the elements in the two sets?

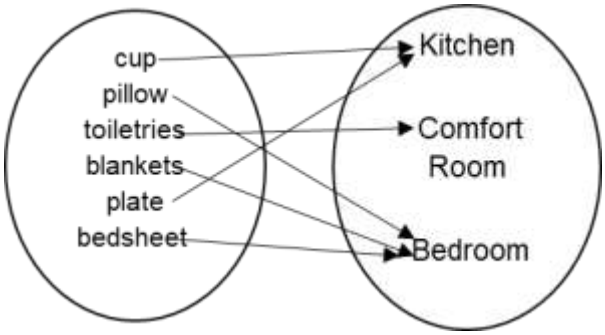
What Is It

In the previous activity, you were asked to connect the elements in set A to its related elements in set B. These are called mapping of elements/ quantities. In mappings, the arrows that connect elements of the two sets are said to be the correspondence of the elements.

Below are the mapping of correspondence illustrated in the previous activity.

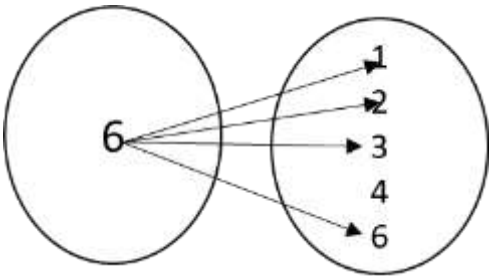


The cost in pesos is related to the number of trays of eggs sold.



Set A Set B

The object (Set A) is related to its proper place in the house (B).



Set A Set B

The given number (Set A) is related to its factors (B).

The illustrations above are examples of a relation.

What is a **relation**?

A **relation** between two sets is any ordered pairs containing one object from each **set**. The elements in the first set where the arrows come from are called **domain**. While the elements of the second set where the arrows end is called **range**. The reason or rule that you follow to make this mapping is the relation of the two sets.

A relation may be classified as one-to-one, many-to-one, or one-to-many. It is **one-to-one relation** if every element in the domain is mapped to a unique element in the range, **many-to-one** if two or more elements in the domain are mapped to only one element in the range, **one-to-many** if each element in the domain is mapped to any two or more elements in the range. A combination of a many-to-one relation and a one-to-many relation is called a **many-to-many** relation.

In the previous activity, the relation between the numbers of trays of eggs to its cost is an example of a one-to-one correspondence, the relation between an object to its proper place is an example of a many-to-one correspondence, while the relation of a given number to its factors is an example of a one-to-many correspondence.

Relation is also evident in other real-life scenarios like the relation between father and daughter, principal and teachers, brothers and sisters, or among animals and their babies, and so on. Now let us take a look on the representations of relations.

Representations of Relations

Aside from mapping, a relation may be represented in four other ways: table, ordered pairs, graph, and equation.

Relation Expressed in a Table

Relationship between two variables can also be presented by a table. The table below illustrates the relationship of the two quantities.

Mr. Reyes is a dealer of poultry eggs. The table shows the cost for each number of trays. The no. of trays of eggs (x) and cost in pesos (y) presented horizontally and vertically

x (no. of trays)	1	2	3	4	5
y (cost in pesos)	210	420	630	840	1050

x (no. of trays)	y (cost in pesos)
1	210
2	420
3	630
4	840
5	1050

a. What is the cost of each tray of eggs?

b. How much would Mr. Reyes receive if he sells 10 trays of eggs? 50 trays?

c. What rule does he have in mind to arrive at this table of values?

Solutions:

a. Php 210

b. Php 2,100 for 10 trays; Php 10,500 for 50 trays

c. Multiply the number of trays by Php 210.

Relations Expressed in Ordered Pairs

Based on the sample problem above, the following ordered pairs were derived from the relationship between the number of trays and the total cost (no. of trays, total cost), then the ordered pairs are (1, 210), (2, 420), (3, 630), (4, 840), (5, 1050) …, and in general as (x, y).

Relations Expressed as a Rule or Equation

A relation may also be presented through an equation in two variables or certain rule expressed in equation. Now let us model the relationship of total cost and the number of trays of eggs through the equation:

Total Cost = (cost per tray of eggs) (number of trays)

If: 210 = 210 (1)

420 = 210 (2)

630 = 210 (3)

840 = 210 (4)

1,050= 210 (5)

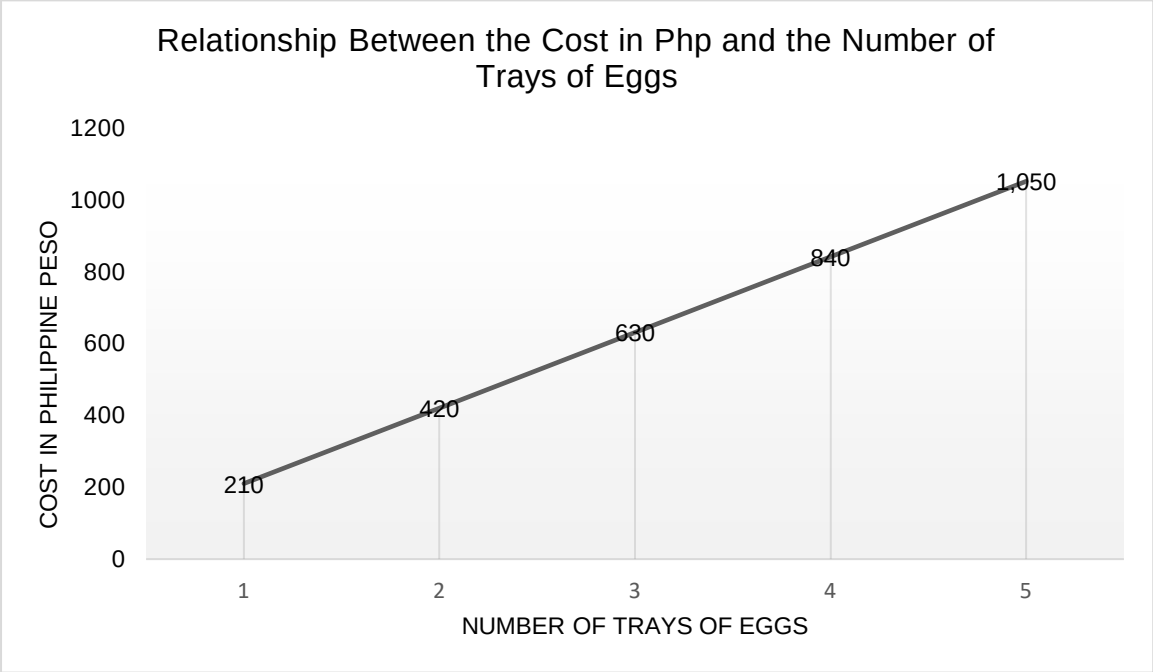
Then, y = 210 (x), is the rule expressed through equation in two variables.

Using the existing rule $y = 210x$, we can determine the total cost of the number of trays of eggs sold.

The set of values of x (number of trays) represents the domain and the set of values of y (total cost in pesos) represents the range.

Relation Described Graphically

Below is the graphical representation of the relationship described above. It illustrates the relationship between the total cost and the number of trays of eggs.



The x- axis represents the number of trays of eggs while the y- axis is the total cost in pesos.

Relations that are Functions

A **function is a special type of relation**. It is a relation where no element in the domain is mapped or paired to more than one element in the range. Going back to the types of relations, which of them can be called function?

By looking at the definition of a function, one-to-one relation and many-to-one relation are functions. One-to-many and many-to-many relations are just mere relation.

Let us examine the next examples for further understanding.

Example 1. Determine which of the following sets of ordered pairs is a function.

A= {(3, 5), (2, 7), (4, 6), (-3, -5)}
B= {(0, 1), (-1, 2), (0, 3), (-2, 4), (-1, 5)}
C= {(-1, 2), (1, -2), (-2,16), (2, -16), (-3, -54), (3,54),...)}

Solution:

Set A is a function since there are no distinct ordered pairs having the same first element.

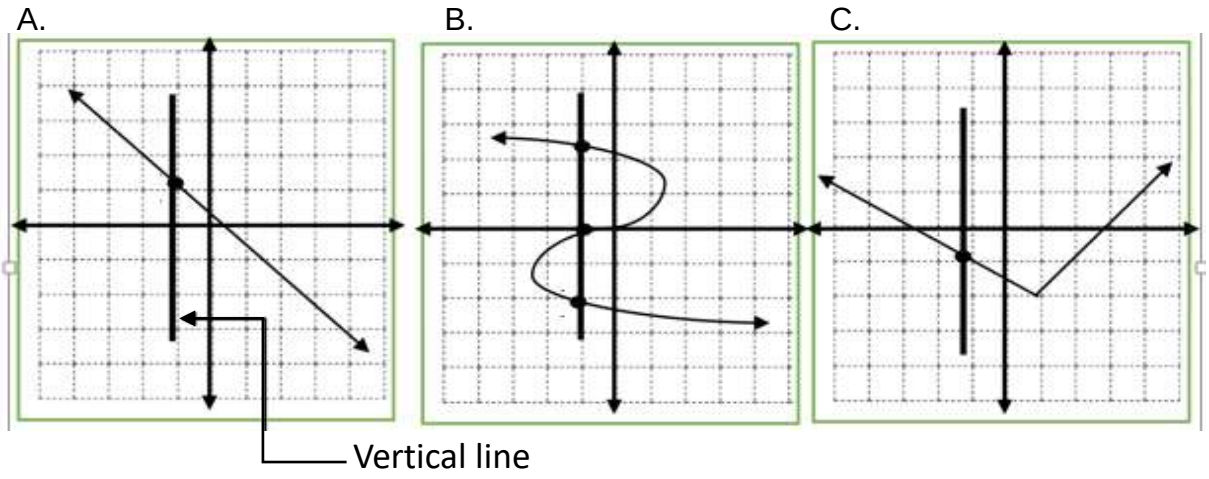
Set B is not a function since ordered pairs (0, 1) and (0, 3) have the same first element.

Set C is an infinite set but the pattern shows that there are no abscissas with the same value; hence Set C is a function.

The **set of ordered pairs** represents a function if no two distinct ordered pairs have the same abscissas (first elements).

Example 2.

A graph can be identified whether it is a function or a mere relation by using the Vertical Line Test (VLT).



Solution:

A. The graph in A is a function since the vertical line touches the graph at exactly one point even if it is moved to the right or to the left.

B. The graph in B is not a function because if we examine the vertical line, it touches the graph more than once.

C. Examining the vertical line in graph C, it touches the graph once. Hence, graph in C is a function.

Vertical Line Test
This is a test which uses vertical line to check whether the relation expressed in graph is a function or not. If every vertical line intersects the graph not more than once, then the graph represents a function.

Example 3

Determine whether the given equation is a function or not.
A. $y = 3x - 2$
B. $y = x^2 + 1$
C. $y^2 = x + 1$
D. $y^3 = x^2 + 2x$

To determine if a given equation is a function, let us assign a test value for x and substitute it to the given equation. If one value of the domain (x) yields exactly a unique value in the range (y) then the equation represents a function, otherwise, it is not a function.

Solution:
A. $y = 3x - 2$

Let us take x = 1, substitute this value of x to y = 3x-2.

$y = 3(1) - 2$
$y = 3 - 2$
$y = 1$, so the ordered pair is (1, 1)

There is only one value of y for one value of x, therefore y= 3x-2 is a function.

B. $y = x^2 + 1$

Let us take x = 2, substitute this value of x to $y = x^2 + 1$.

$y = (2)^2 + 1$
$y = 4 + 1$
$y = 5$, so the ordered pair is (2, 5)

There is only one value of y for one value of x, therefore $y = x^2 + 1$ is a function.

C. $y^2 = x + 1$

`Let us take x = 3, substitute this value of x to the equation.

$y^2 = 3 + 1$, extract the square root of both sides of the equation.

$$y^2 = 4$$
$$\sqrt{y^2} = \pm\sqrt{3+1}$$

$y = \pm\sqrt{4}$

$y = \pm 2$, so the ordered pairs are (3, 2) and (3, -2)

There are two values of y for one value of x, therefore. $y^2 = x + 1$ is not a function.

D. $y^3 = x^2 + 2x$

Let us take x = 2, substitute this value of x to the equation

$.y^3 = 2^2 + 2(2)$

$y^3 = 4 + 4$

$\sqrt[3]{y^3} = \sqrt[3]{8}$ Extracting the cube root of both sides of the equation

y = 2, so the ordered pair is (2, 2).

There is only one value of y for one value of x, therefore $y^3 = x^2+2x$ is a function.

Note:

- If one value of the domain yields exactly one unique value in the range, then the equation represents a function.
- If a rule or an equation represents a function, then it can be written in the form of y = f(x).

Example 4:

The rule of function is also evident in some real-life relationships. For instance, *the relationship of a child to his biological mother* is a function since there is no child that has two or more biological mothers, the relation is one-to-one, thus, a function.

Tell whether the following real-life relationships are a function or a mere relation.

A. The rule that exists between each person to the name of his/ her brother.
B. The rule that exists between every person and to the name of his/her biological father.

Answer:

A. There are people who have two or more brothers, hence the rule which each person is paired to his/ her brother is a mere relation.
B. Every person has only one biological father. Therefore, the rule that every person relates to the name of his/her biological father is a one-to-one relation, therefore, it is a function.

Note: All functions are relations but some relations are not functions.

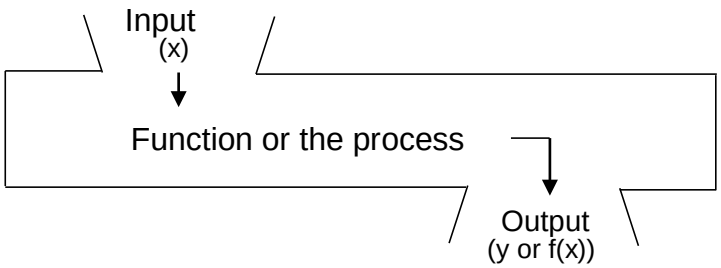
Function Notation

The function notation y = f(x), which is read as "y equals f of x" or y is a function of x" is used to denote a functional relationship between x and y variables.

If there is a rule relating y to x such as $y = 5x + 2$, and if the relation is a function, then you can also write this in function notation $f(x) = 5x + 2$. $f(x)$ represents the value of the function at x. The name of the function is f.Other letters may be used to name functions.

The domain of a function f is the set of values of x for which f is defined. The range of a function f is the set of all values of $f(x)$, where x is an element of the domain of f.

The figure below shows the domain as the set of input values represented by x and the range as the set of the values of the function's output represented by $f(x)$.



To find f(x) for a given value of x is to evaluate the function f by substituting the value of x into the equation.

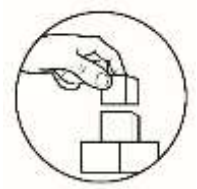
For example:

Given the function, $f(x) = -2x + 1$. Find $f(3)$ and $f(-3)$.

Solution:

a. $f(x) = -2x + 1$ Function Rule
$f(3) = -2(3) + 1$ Substituting the value of x by 3 (input)
$f(3) = -6 + 1$ Simplify by multiplying -2 and 3
$f(3) = -5$ By simplifying further, it results to -5 (output)

b. $f(x) = -2x + 1$ Function Rule
$f(-3) = -2(-3) + 1$ Substituting x by -3 (input)
$f(-3) = 6 + 1$ Simplifying
$f(-3) = 7$ By simplifying further, it results to 7 (output)



What's More

Activity 1 - Complete me up!

Directions: Use the given set of ordered pairs to complete the table of values, draw its graph, illustrate the mapping, and generate its rule. The first two values are done for you.

Set of ordered pairs:
{(-3, -2), (-2,0), (-1,2), (0,4), (1,6), (2,8)}

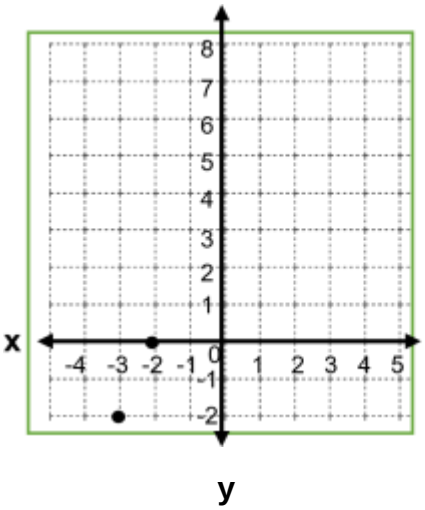
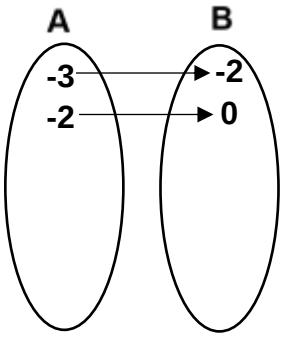


Table:

x	y
-3	-2
-2	0
-1	
0	
1	
2	

Rule: _____

Mapping Diagram

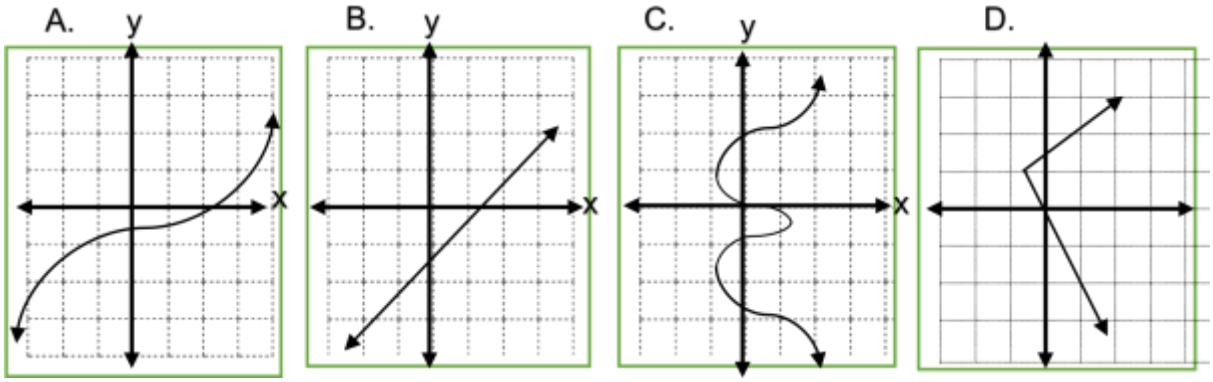


Questions:

a. Did you have any difficulty in representing the ordered pairs into graph, table, mapping and rule? If so, elaborate. What will you do to address this difficulty?
b. What type of relation is illustrated through many representations?
c. Is the relation a function or a mere relation?

Activity 2

Directions: Determine which of the following graphs is a function or a mere relation, and then describe each graph.



Questions:

1. At how many point/s will the vertical line intersect the graph in A? B? C? D?
2. How did you determine that the graph represent a function? a mere relation?
3. Which of the graphs are functions?
4. Which of the graphs are just a relation?

Activity 3.

Directions: Given the rule, complete the table of values and determine whether it is a function or a mere relation. An example is provided for each item. Use a separate sheet of paper for your solution.

A. 1. Equation: $y = 3x - 2$

Solution:

$x = -2$

$y = 3x - 2$

$y = 3(-2) - 2$

$y = (-6) - 2$

$y = -8$

The equation $y = 3x - 2$ represents a_____.

Table of values

x	y
-2	-8
-1	
0	

2. Equation: $y^2 + x = 2$

Solution: $x = -2$,

$y^2 - 2 = 2$

$y^2 = 2 + 2$

$y^2 = 4$

$\sqrt{y^2} = \pm\sqrt{4}$

$y = \pm 2$

x	y
-2	±2
-1	
0	

The equation: $y^2 + x = 2$ represents a _____.

3. Equation: $y = 2x^2 + 3x - 1$
   Solution: $x = -2$
   $y = 2(-2)^2 + 3(-2) - 1$
   $y = 8 - 6 - 1$
   $y = 1$

   The equation $y = 2x^2 + 3x - 1$ represents a _____.

x	y
-2	1
-1	
0	

B. Write the set of ordered pairs of each rule.

1. $y = 3x - 2$: _____

2. $y^2 + x = 2$: _____

3. $y = 2x^2 + 3x - 1$: _____

Questions:

1. How did you determine if the equation represents a function or a mere relation?
2. Which of the equations is a function?
3. Which of the equations is a mere relation?

What I Have Learned

Complete the following sentences.

In this lesson, I learned that a relation is_____.

A function is_____.

A relation is not a function when_____.

A functional notation is _____.

What I Can Do

John, a Grade 8 student received his grades from all the subjects he had taken and it is written in a set of ordered pairs. His mother wanted it to be written through diagram or mapping. Can you help him do it? Then, identify whether the rule between the subjects and respective grades is a function or a mere relation.

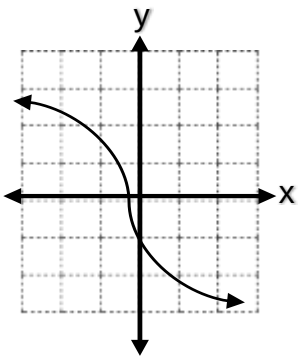
A = {(Eng., 85), (Fil., 89), (Math, 90), (Sci, 87), (Aral Pan., 89), (TLE,88),

(MAPEH,85), (EsP,91)}

Assessment

Directions: Choose the letter of the correct answer. Write the letter of your answer on a separate sheet of paper.

1. Identify which statement best describes the graph.



   A. It is a function since the vertical line will touch the graph at three points.
   B. It is a function since the vertical line will touch the graph at exactly one point.
   C. It is a mere relation since the vertical line will touch the graph at three points.
   D. It is a mere relation since the vertical line will touch the graph at exactly one point.

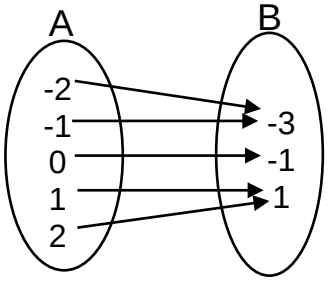
2. Which of the following sets of ordered pairs represents a function?
   A. { (0,2), (1, 3), (2, 4), (3, 5), (4, 6) }
   B. { (0,1), (0, 2), (0, 3), (0, 4), (0,5) }
   C. { (0,2), (1, 3), (1, 4), (3, 5), (3, 6) }
   D. { (0,0), (4, 2), (4,-2), (9,3),(9,-3) }

3. Which of the following equations represents a function?
   A. $y = 3x - 6$
   B. $7x - 5 = y^2$
   C. $6x + y^2 = 12$
   D. $y + y^4 = 4x + 5$

4. Which of the following rules represents a mere relation?
   A. children and mother at home
   B. the area of a circle and its radius
   C. the amount of a company tax and its net profit
   D. the salary of a worker and the number of hours rendered

5. Which of the following represents a function?
   A. $x^2 + y = 2$
   B. $x^2 + y^2 = 2$
   C. $x + y^2 = 10$
   D. $x + 2y^2 = 10$

6. Given the mapping at the right, which set of ordered pairs described the mappings of elements in set A to B?



   A. {(-2, -3),(-1,-1),(0,-1),(1,1),(2,1)}
   B. {(-2,-3),(-1,-3),(0,-1),(1,1),(2,1)}
   C. {(-2,3),(-1,-1),(0,-1),(1,1),(2,-1)}
   D. {(2,-3),(-1, -3),(0,-1),(1,1),(2, -3)}

7. Given the function $f(x) = 2x - 5$, find the value of $f(4)$.
   A. -3 B. 0 C. 3 D. 7

8. Given the function y = 3x − 1, which of the following illustrates the ordered pairs of the function?
   A. {(-2,-7),(-1,-4),(0,-1),(1,2),(2,5)}
   B. {(-2,-5),(-1,-3),(0,1),(1, -3),(2,6)}
   C. {(-2,-6),(-1,-3),(0,-1),(1,4),(2,5)}
   D. {(-2,7),(-1,4),(0,-1),(1,-2),(2,-5)}

9. Given the y = 7x – 5, which representation best describes the relation?
   A. Mapping/Diagram B. Graph C. Rule D. Table

For items 10 – 12. Ana and her mother went to the market to buy fish for their picnic. The fish that they want to buy has a price of *P*300 per kilo, but the vendor is willing to give them a discount of *P*50.

10. What function best describes the relation if y represents the amount of money they will pay and x represents the weight of the fish in kilograms?
    A. y = 300x + 50 B. y = 50x + 300 C. y = 300x−50 D. y = 50x − 300

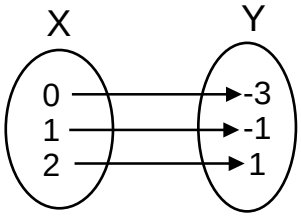
11. If Ana and her mother will buy 5 kilos of fish, how much will they pay?
    A. *P*1,550 B. *P*1,450 C. *P*1,350 D. *P*1,250

12. If Ana and her mother will be given a discount of *P*100.00 for every purchase of 5 kilos and they will buy 10 kilos, how much does it cost?
    A. *P*2,600 B. *P*2,700 C.*P*2,800 D.*P*2,900

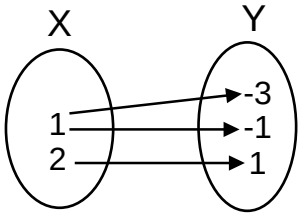
13. Which of the following ordered pairs shows one-to-one correspondence?
    A. {(Christian, Row 1),(Johny, Row 2),(Charles, Row 2)}
    B. {(pencil, paper),(ball pen, paper),(ink, printer),(ink, marker pen)}
    C. {(Ms.Cali, Eng.Teacher), (Ms.Cali, EsP Teacher), (Ms.Cali, Sci. Teacher)}
    D. (English, red notebook),(Science, blue notebook),(Math, yellow notebook)}

14. Which of the following mapping illustrates a many-to-one correspondence?

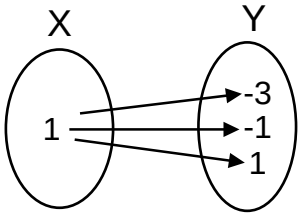
A.



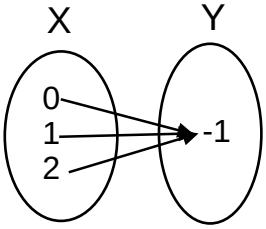
B.



C.



D.



15. The rule 5x + y = 3 represents a relation. What would be the value of y when x = -3?

A. 18 B. 12 C. -12 D. -18

Additional Activities

To strengthen the mastery in this lesson, create a jingle that will help you remember the processes of illustrating and verifying a relation and a function. Below is a rubric which will guide you on how your output will be graded in this activity.

Rubric for Creating a Math Jingle

CRITERIA	**Outstanding 4**	**Satisfactory 3**	**Developing 2**	**Beginning 1**
Creativity	The composition is comprehensive and displays the aesthetic aspects of the mathematical concepts of Relation and Function.	The composition is presentable and makes use of the concepts of Relation and Function representation.	The composition makes use of the concepts of Relation and a Function	The composition does not use the concepts of Relation and Function
Lyrics	It is arranged logically and relevant to the lesson.	It is arranged logically but not relevant to the lesson.	It is arranged but not relevant to the lesson.	It is not arranged logically and not relevant to the lesson.
Mathematical Reasoning	The explanation is very clear, thorough and coherent. It includes interesting facts and principles.	The explanation is clear and coherent. It includes interesting facts and principles.	The explanation is clear, but not coherent and it includes less interesting facts and principles.	The explanation is not clear, and coherent. It does not include interesting facts and principles.

Answer Key

Activity 3:

1.

x	-2	-1	0
y	-8	-5	-2

2.

x	-2	-1	0
y	0	$\pm\sqrt{3}$	$\pm\sqrt{2}$

3.

x	-2	-1	0
y	1	-2	-1

1. $y = 3x - 2$ - function
2. $y^2 - x = 2$ - mere relation
3. $y = 2x^2 + 3x - 1$ - function

B. Set of ordered pairs:

1. {(-2,-8), (-1,-5), (0, -2)}
2. {(-2,0),(-1, ±√3),(0, ±√2)}
3. {(-2,-1), (-1,-2),(0, -1)}

Answers to Questions

1 Substitution, APE, extracting square roots, raising to a power

2 Function – if one value of x yields a unique value of y, mere relation if one value of x yields to or more values of y

3 Equations 1 and 3 are functions

4 Equation 2 is a mere relation

What I Have Learned

In this lesson, I learned that a relation is the connection of an individual or quantities to another individual or quantities. In mathematics, it is the relationship between two variables, set of ordered pairs or the relationship between the domain and range.

A function is a type of relation where each element of the domain is paired only once to the elements of the range. In other words, in every element of the first set there is one and only element paired with the second set.

A relation is not a function when there are two ordered pairs that have the same domain or abscissa.

A function notation is a method in which a function is expressed in symbols and signs

What I Can Do

Since the relation is one-to-one, therefore it is a function.

Assessment

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

What I Know

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

What's In

1.Agusan del Sur (-1, -3)
2.Bayugan City (0, -1.5)
3.Bislig City (3, -3)
4.Butuan City (-1, -1)
5.Cabadbaran City (-1,0)
6.Dinagat Islands (-1, 3)
7.Siargao Islands (1, 2.5)
8. Surigao del Norte (0,1)
9.Surigao del Sur (2. -2)
10.Tandag City (2,0)

What's New

1. a. Cost depends upon the number of trays sold
   b. one-to-one
2. a. Cups, plate are things found in the kitchen;
   Pillows, blankets, bedsheets are found in the bedroom;
   Toiletries are found in the comfort room.
   b. many-to-one
3. the given number 6 is related to its factors 1,2,3,6

What's More

Activity 1

1.

2. One-to-one relation
3. function

Activity 2

A. Function
B. Function
C. Mere Relation or not a function
D. Mere Relation or not a function

Questions:

1.A- one, B- one, C- four, D- two
2. Using VLT, function if the vertical line intersects the graph at exactly one point. mere relation if the vertical line intersects the graph more than one point.
3. A and B are functions.

References

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