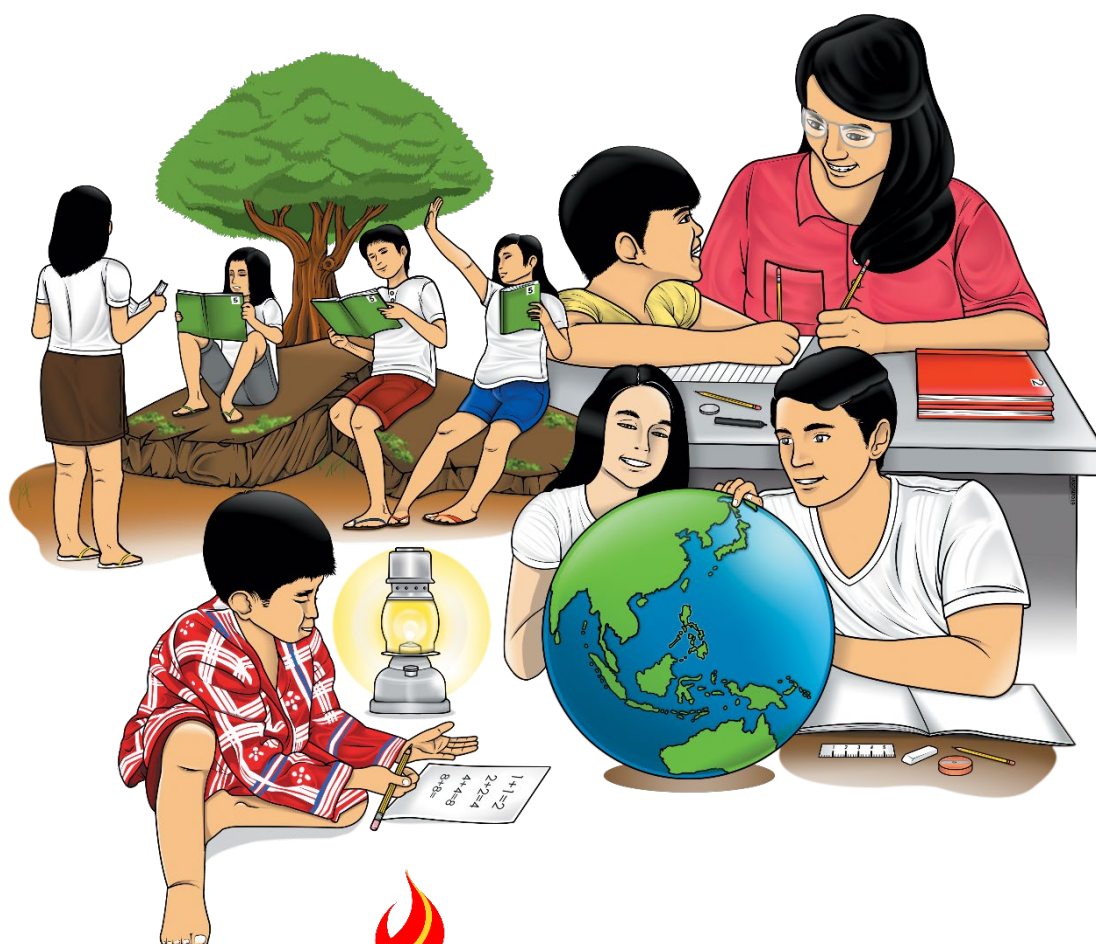


Senior High School

General Mathematics

Quarter 1 – Module 1: Functions



General Mathematics
Alternative Delivery Mode
Quarter 1 – Module 1: Functions
First Edition, 2021

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Senior High School

General Mathematics

Quarter 1 – Module 1:

Functions

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.

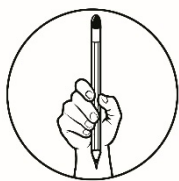


What I Need to Know

This module was designed and written with you in mind. It is here to help you master the key concepts of functions specifically on representing functions in real life situations. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

After going through this module, you are expected to:

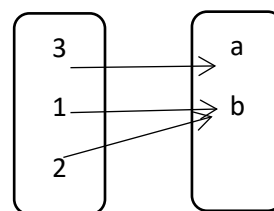
1. recall the concepts of relations and functions;
2. define and explain functional relationship as a mathematical model of situation; and
3. represent real-life situations using functions, including piece-wise function.



What I Know

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

- What do you call a relation where each element in the domain is related to only one value in the range by some rules?
 - Function
 - Range
 - Domain
 - Independent
- Which of the following relations is/are function/s?
 - $x = \{(1,2), (3,4), (1,7), (5,1)\}$
 - $g = \{(3,2), (2,1), (8,2), (5,7)\}$
 - $h = \{(4,1), (2,3), (2, 6), (7, 2)\}$
 - $y = \{(2,9), (3,4), (9,2), (6,7)\}$
- In a relation, what do you call the set of x values or the input?
 - Piecewise
 - Range
 - Domain
 - Dependent
- What is the range of the function shown by the diagram?
 - $R:\{3, 2, 1\}$
 - $R:\{a, b\}$
 - $R:\{3, 2, 1, a, b\}$
 - $R:\{\text{all real numbers}\}$



- Which of the following tables represent a function?

a.

x	0	1	1	0
y	4	5	6	7

b.

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

c.

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

d.

x	0	-1	3	2
y	3	4	5	6

6. Which of the following real-life relationships represent a function?
 - a. The rule which assigns to each person the name of his aunt.
 - b. The rule which assigns to each person the name of his father.
 - c. The rule which assigns to each cellular phone unit to its phone number.
 - d. The rule which assigns to each person a name of his pet.

7. Which of the following relations is **NOT** a function?
 - a. The rule which assigns a capital city to each province.
 - b. The rule which assigns a President to each country.
 - c. The rule which assigns religion to each person.
 - d. The rule which assigns tourist spot to each province.

8. A person is earning ₱500.00 per day for doing a certain job. Which of the following expresses the total salary ***S*** as a function of the number ***n*** of days that the person works?
 - a. $S(n) = 500 + n$
 - b. $S(n) = \frac{500}{n}$
 - c. $S(n) = 500n$
 - d. $S(n) = 500 - n$

For number 9 - 10 use the problem below.

Johnny was paid a fixed rate of ₱ 100 a day for working in a Computer Shop and an additional ₱5.00 for every typing job he made.

9. How much would he pay for a 5 typing job he made for a day?
 - a. ₱55.00
 - b. ₱175.50
 - c. ₱125.00
 - d. ₱170.00

10. Find the fare function $f(x)$ where x represents the number of typing job he made for the day.
 - a. $f(x) = 100 + 5x$
 - b. $f(x) = 100 - 5x$
 - c. $f(x) = 100x$
 - d. $f(x) = \frac{100}{5x}$

For number 11 - 12 use the problem below.

A jeepney ride in Lucena costs ₱ 9.00 for the first 4 kilometers, and each additional kilometers adds ₱0.75 to the fare. Use a piecewise function to represent the jeepney fare **F** in terms of the distance **d** in kilometers.

$$F(d) = \begin{cases} 11. \underline{\hspace{2cm}} \\ 12. \underline{\hspace{2cm}} \end{cases}$$

11.

- a. $F(d) = \{9 \text{ if } 0 > d \leq 4$
- b. $F(d) = \{9 \text{ if } 0 < d < 4$
- c. $F(d) = \{9 \text{ if } 0 \geq d \geq 4$
- d. $F(d) = \{9 \text{ if } 0 < d \leq 4$

12.

- a. $F(d) = \{9 + 0.75(n) \text{ if } 0 > d \leq 4$
- b. $F(d) = \{(9 + 0.75) \text{ if } d > 4$
- c. $F(d) = \{(9 + 0.75) \text{ if } d < 4$
- d. $F(d) = \{(9 + 0.75(n) \text{ if } d > 4$

For number 13 - 15 use the problem below.

Under a certain Law, the first ₱30,000.00 of earnings are subjected to 12% tax, earning greater than ₱30,000.00 and up to ₱50,000.00 are subjected to 15% tax, and earnings greater than ₱50,000.00 are taxed at 20%. Write a piecewise function that models this situation.

$$t(x) = \begin{cases} 13. \underline{\hspace{2cm}} \\ 14. \underline{\hspace{2cm}} \\ 15. \underline{\hspace{2cm}} \end{cases}$$

13.

- a. $t(x) = 0.12x \text{ if } x \leq 30,000$
- b. $t(x) = 0.12x \text{ if } x < 30,000$
- c. $t(x) = 0.12x \text{ if } x > 30,000$
- d. $t(x) = 0.12x \text{ if } x \geq 30,000$

14.

- a. $t(x) = 0.15x \text{ if } 30,000 < x \geq 50,000$
- b. $t(x) = 0.15x \text{ if } 30,000 < x \leq 50,000$
- c. $t(x) = 0.15x \text{ if } 30,000 \leq x \geq 50,000$
- d. $t(x) = 0.15x \text{ if } 30,000 \geq x \geq 50,000$

15.

- a. $t(x) = 0.20x \text{ if } x \geq 50,000$
- b. $t(x) = 0.20x \text{ if } x \leq 50,000$
- c. $t(x) = 0.20x \text{ if } x > 50,000$
- d. $t(x) = 0.20x \text{ if } x < 50,000$

Lesson

1

Representing Real-Life Situations Using Functions

Welcome to the first lesson of your General Mathematics. This lesson will give you the practical application of functions in a real-life scenario including the piece-wise function. When you are in Grade 8, you already encountered relation and function. But in this module, let's take into a deeper sense on how this topic can be useful in our daily life. Are you all ready?



What's In

Before we proceed in representing real-life scenario using function, let's go back to where we start. What have you remembered about relations and functions?

A **relation** is any set of ordered pairs. The set of all first elements of the ordered pairs is called the *domain* of the relation, and the set of all second elements is called the *range*.

A **function** is a relation or rule of correspondence between two elements (domain and range) such that each element in the domain corresponds to exactly one element in the range.

To further understand function, let's study the following.

Given the following ordered pairs, which relations are functions?

$$A = \{(1,2), (2,3), (3,4), (4,5)\}$$

$$B = \{(3,3), (4,4), (5,5), (6,6)\}$$

$$C = \{(1,0), (0, 1), (-1,0), (0,-1)\}$$

$$D = \{(a,b), (b, c), (c,d), (a,d)\}$$

You are right! The relations A and B are functions because each element in the domain corresponds to a unique element in the range. Meanwhile, relations C and D are not functions because they contain ordered pairs with the same domain $C = (0,1)$ and $(0,-1)$, $D = (a,b)$ and (a,d) .

How about from the given table of values, which relation shows a function?

A.

x	1	2	3	4	5	6
y	2	4	6	8	10	12

B.

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

C.

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

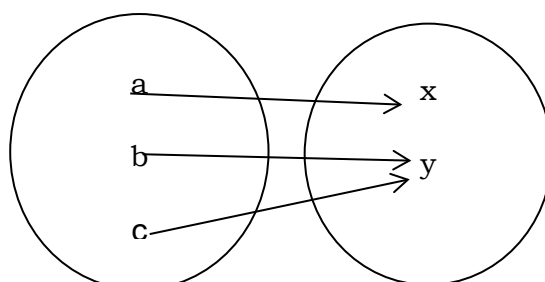
That's right! A and B are functions since all the values of x corresponds to exactly one value of y. Unlike table C, where -1 corresponds to two values, 4 and 1.

We can also identify a function given a diagram. On the following mapping diagrams, which do you think represent functions?

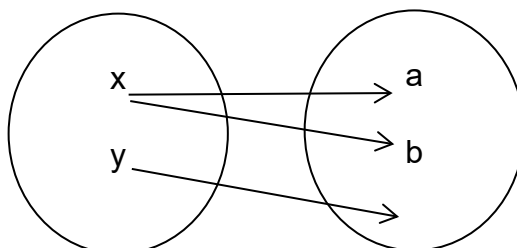
Domain

Range

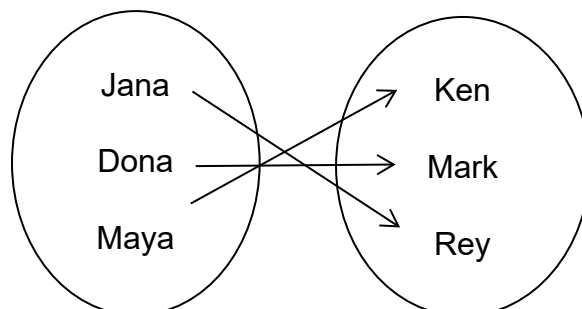
A.



B.



C.



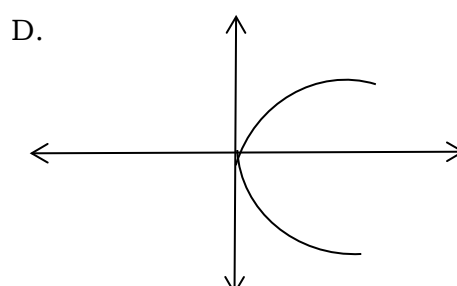
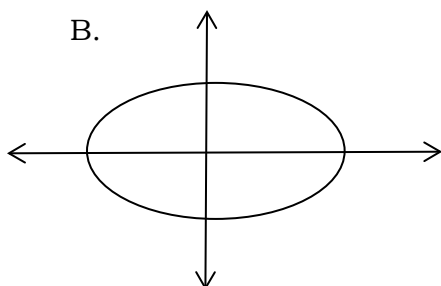
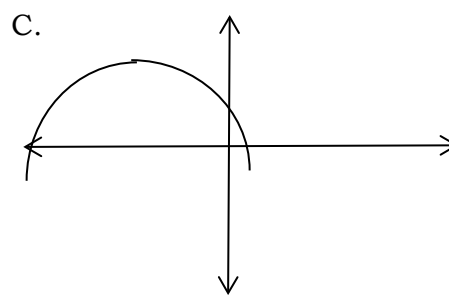
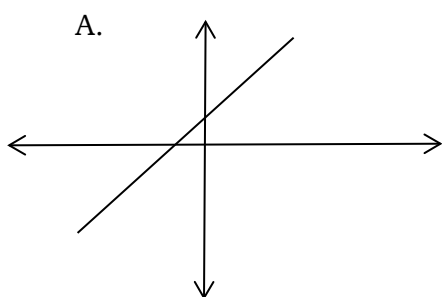
You are correct! The relations A and C are functions because each element in the domain corresponds to a unique element in the range. However, B is a mere relation and not function because there is a domain which corresponds to more than one range.

How about if the given are graphs of relations, can you identify which are functions? Do you still remember the vertical line test? Let's recall.

A relation between two sets of numbers can be illustrated by graph in the Cartesian plane, and that a function passes the **vertical line test**.

A graph of a relation is a function if any vertical line drawn passing through the graph intersects it at exactly one point.

Using the vertical line test, can you identify the graph/s of function?



Yes, that's right! A and C are graphs of functions while B and D are not because they do not pass the vertical line test.

In Mathematics, we can represent functions in different ways. It can be represented through words, tables, mappings, equations and graphs.



What's New

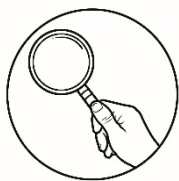
We said that for a relation to become a function, the value of the domain must correspond to a single value of the range. There is the input and the output relationship. So, let's read the following situations that show function and in your own words explain how each scenario depicts function.

1. Mark went to 8-12 store to buy some soda. He puts money, punches a specific button, then the soda drops from the slot machine. What is the function rule?

2. Mr. Marquez, a Mathematics teacher asked his students to measure the diameter and circumference of several round containers or lids and record that data in a table. What do you think they would discover and what is the function rule?

3. Margareth is being paid ₱ 50.00 per hour in doing a certain job. Working 5 days a week for 8 hours per day, she's able to received ₱ 2,000 per week. How do you the situation illustrate a function?

4. To measure the height of a Narra tree, a group of Senior High School students measure its shadow using a meter stick. How do you think functions can be applied in the situation?



What is It

Functions as representations of real-life situations

The situations above all illustrate functions. The function rule in the first situation is the product price. The input (domain) is the money used by Mark combined with selected button while the output (range) is the product. This also shows a one-to-one correspondence where a specific amount corresponds to a specific product.

The diameter-circumference relationship is also a function. The diameter is the input while the circumference is the output. What's the function rule? As they divide each circumference by its diameter they would notice a constant ratio which is a rough approximation of pi.

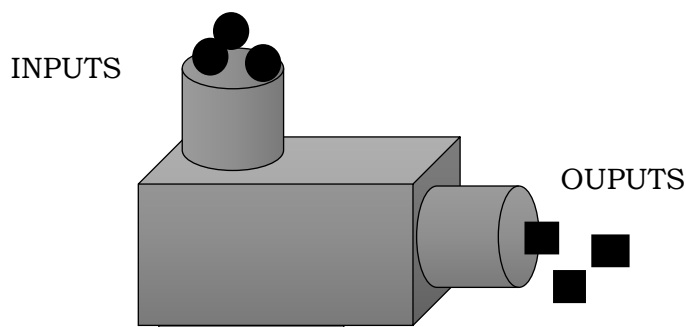
A weekly salary is a function of the hourly pay rate and the number of hours worked. This function was being illustrated by the third situation where Margareth was being paid for her doing a specific job. This could also illustrate a many-to-one relationship where the employees (domain) including Margareth is receiving the same amount of salary (range).

Then lastly, the length of a shadow is a function of its height and the time of day. This is what the group of students applied to measure the height of the Narra tree. The same function rule (ratio) by which we compare the length of an upright ruler to its shadow will help us find the unknown input (the height of the large object) when we measure its shadow.

All the given situations above can be illustrated using what we call a function machine.

The Function Machine

Function can be illustrated as a machine where there is the input and the output. When you put an object into a machine, you expect a product as output after the process being done by the machine. For example, when you put an orange fruit into a juicer, you expect an orange juice as the output and not a grape juice. Or you will never expect to have two kinds of juices - orange and grapes.



You have learned that function can be represented by equation. Since output (y) is dependent on input (x), we can say that y is a function of x . For example, if a function machine always adds three (3) to whatever you put in it. Therefore, we can derive an equation of $x + 3 = y$ or $f(x) = x + 3$ where $f(x) = y$.

Let's try to create equations using the following situations.

- A. If height (H) is a function of age (a), give a function H that can represent the height of a person in a age, if every year the height is added by 2 inches.

Solution:

Since every year the height is added by 2 inches, then the height function is **$H(a) = 2 + a$**

- B. If distance (D) is a function of time (t), give a function D that can represent the distance a car travels in t time, if every hour the car travels 60 kilometers.

Solution:

Since every hour, the car travels 60 kilometers, therefore the distance function is given by **$D(t) = 60t$**

- C. Give a function B that can represent the amount of battery charge of a cellular phone in h hour, if 12% of battery was loss every hour.

Solution:

Since every hour losses 12% of the battery, then the amount of battery function is **$B(h) = 100 - 0.12h$**

- D. Squares of side x are cut from each corner of a 10 in x 8 in rectangle, so that its sides can be folded to make a box with no top. Define a function in terms of x that can represent the volume of the box.

Solution:

The length and width of the box are $10 - 2x$ and $8 - 2x$, respectively. Its height is x . Thus, the volume of the box can be represented by the function.

$$V(x) = (10 - 2x)(8 - 2x)(x) = 80x - 36x^2 + 4x^3$$

Piecewise Functions

There are functions that requires more than one formula in order to obtain the given output. There are instances when we need to describe situations in which a rule or relationship changes as the input value crosses certain boundaries. In this case, we need to apply the piecewise function.

A piecewise function is a function in which more than one formula is used to define the output. Each formula has its own domain, and the domain of the function is the union of all these smaller domains. We notate this idea like this:

$$f(x) = \begin{cases} \text{formula 1 if } x \text{ is in domain 1} \\ \text{formula 2 if } x \text{ is in domain 2} \\ \text{formula 3 if } x \text{ is in domain 3} \end{cases}$$

Look at these examples!

- A. A user is charged ₱250.00 monthly for a particular mobile plan, which includes 200 free text messages. Messages in excess of 200 are charged ₱1.00 each. Represent the monthly cost for text messaging using the function $t(m)$, where m is the number of messages sent in a month.

Answer:

$$t(m) = \begin{cases} 250 & \text{if } 0 < m \leq 200 \\ (250 + m) & \text{if } m > 200 \end{cases}$$

For sending messages of not exceeding 200
In case the messages sent were more than 200

- B. A certain chocolate bar costs ₱50.00 per piece. However, if you buy more than 5 pieces they will mark down the price to ₱48.00 per piece. Use a piecewise function to represent the cost in terms of the number of chocolate bars bought.

Answer:

$$f(n) = \begin{cases} 50 & \text{if } 0 < n \leq 5 \\ (48n) & \text{if } n > 5 \end{cases}$$

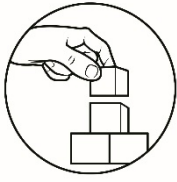
For buying 5 chocolate bars or less
For buying more than 5 chocolate bars

- C. The cost of hiring a catering service to serve food for a party is ₱250.00 per head for 50 persons or less, ₱200.00 per head for 51 to 100 persons, and ₱150.00 per head for more than 100. Represent the total cost as a piecewise function of the number of attendees to the party.

Answer:

$$C(h) = \begin{cases} 250 & \text{if } n \leq 50 \\ 200 & \text{if } 51 \leq n \leq 100 \\ 150 & \text{if } n > 100 \end{cases}$$

Cost for a service to at least 50 persons
Cost for a service to 51 to 100 persons
Cost for a service to more than 100 persons



What's More

Read each situation carefully to solve each problem. Write your answer on a separate sheet of your paper.

Independent Practice 1

1. A person is earning ₱750.00 per day to do a certain job. Express the total salary **S** as a function of the number **n** of days that the person works.

Answer:

$$S(n) = \underline{\hspace{2cm}}$$

(Hint: Think of the operation needed in order to obtain the total salary?)

2. Xandria rides through a jeepney which charges ₱ 9.00 for the first 4 kilometers and additional ₱0.50 for each additional kilometer. Express the jeepney fare (**F**) as function of the number of kilometers (**d**) that Xandria pays for the ride.

Answer:

$$F(d) = \underline{\hspace{2cm}}$$

(Hint: Aside from the usual fare charge, don't forget to include in the equation the additional fare charge for the exceeding distance)

Independent Assessment 1

1. A computer shop charges ₱15.00 in every hour of computer rental. Represent your computer rental fee (**R**) using the function $R(t)$ where **t** is the number of hours you spent on the computer.

Answer:

2. Squares of side **a** are cut from each corner of a 8 in x 6 in rectangle, so that its sides can be folded to make a box with no top. Represent a function in terms of **a** that can define the volume of the box.

Answer:

Independent Practice 2

1. A tricycle ride cost ₱10.00 for the first 2 kilometers, and each additional kilometer adds ₱8.00 to the fare. Use a piecewise function to represent the tricycle fare in terms of the distance **d** in kilometers.

Answer:

$$C(d) = \begin{cases} 10 & \text{if } \underline{\hspace{1cm}} \\ (\underline{\hspace{1cm}}) & \text{if } d \geq 3 \end{cases}$$

(Fill in the missing terms to show the piecewise function of the problem)

3. A parking fee at SM Lucena costs ₱25.00 for the first two hours and an extra ₱5.00 for each hour of extension. If you park for more than twelve hours, you instead pay a flat rate of ₱100.00. Represent your parking fee using the function $p(t)$ where t is the number of hours you parked in the mall.

Answer:

$$p(t) = \begin{cases} 25 & \text{if } \underline{\hspace{1cm}} \\ (25 + 5t) & \text{if } \underline{\hspace{1cm}} \\ \underline{\hspace{1cm}} & \text{if } t > 12 \end{cases} \quad \begin{array}{l} \text{(Fill in the missing terms to show the} \\ \text{piecewise function of the problem)} \end{array}$$

Independent Assessment 2

1. A van rental charges ₱5,500.00 flat rate for a whole-day tour in CALABARZON of 5 passengers and each additional passenger added ₱500.00 to the tour fare. Express a piecewise function to show to represent the van rental in terms number of passenger n .

Answer:

2. An internet company charges ₱500.00 for the first 30 GB used in a month. Every exceeding GB will then cost ₱30.00 But if the costumer reach a total of 50 GB and above, a flat rate of ₱1,000.00 will be charged instead. Write a piecewise function $C(g)$ that represents the charge according to GB used?

Answer



What I Have Learned

A. Read and analyze the following statements. If you think the statement suggests an incorrect idea, rewrite it on the given space, otherwise leave it blank.

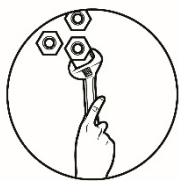
1. A relation is a set of ordered pairs where the first element is called the range while the second element is the domain.

2. A function can be classified as one-to-one correspondence, one-to-many correspondence and many-to-one correspondence.

3. In a function machine, the input represents the independent variable while the output is the dependent variable.

- B. In three to five sentences, write the significance of function in showing real-life situations.

- C. In your own words, discuss when a piecewise function is being used.



What I Can Do

At home or in your community, look for at least three (3) situations that could represent functions. From the identified situations, write a sample problem and its corresponding function equation.

Example:

Situation: The budget for food is a function of the number of family members.

Problem: Reyes family has Php ₱1,500.00 food budget for each member of their family in a month. Express the total food budget (B) as a function of number of family members (n) in one month.

Function: $B(x) = 1500x$

Criteria	4	3	2	1
Relevance	Gave 3 situations and sample problems relative to the topic and well-organized	Gave 2 situations and sample problems relative to the topic and well-organized	Gave 1 situation and sample problem relative to the topic and well-organized	Did not give any situation nor sample problem relative to the topic and well-organized
Content	Included 3 correct function equations	Included 2 correct function equations	Included 1 correct function equation	Did not include any correct function equation



Assessment

Multiple Choice. Choose the letter of the best answer and write the chosen letter on sheet of paper.

1. Which of the following is **not true** about function?
 - a. Function is composed of two quantities where one depends on the other.
 - b. One-to-one correspondence is a function.
 - c. Many-to-one correspondence is a function.
 - d. One-to-many correspondence is a function.
2. In a relation, what do you call the y values or the output?
 - a. Piecewise
 - b. Range
 - c. Domain
 - d. Independent

3. Which of the following tables is **NOT** a representation of functions?

a.

x	2	1	0	1
y	3	6	7	2

b.

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

c.

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

d.

x	0	2	4	6
y	6	5	4	3

4. In this table, what is the domain of the function?

x	1	2	3	4	5
y	a	b	c	d	e

- a. $D: \{2, 4, 6, 8, 10\}$
- b. $D: \{a, b, c, d, e\}$
- c. $D: \{1, 2, 3, 4, 5\}$
- d. $y = \{1, 2, 3, 4, 5, a, b, c, d\}$

5. Which of the following relations is/are function/s?
- $x = \{(-1,2), (-3,4), (-1,7), (5,1)\}$
 - $g = \{(-3,2), (3,1), (-3,2), (5,7)\}$
 - $h = \{(6,1), (-2,3), (2, 6), (7, 2)\}$
 - $y = \{(2,3), (3,2), (-2,3), (3, -2)\}$
6. Which of the following relations is/are function/s?
- the rule which assigns to each person the name of his brother
 - the rule which assigns the name of teachers you have
 - the rule which assigns a pen and the color of its ink
 - the rule which assigns each person a surname
7. A person can encode 1000 words in every hour of typing job. Which of the following expresses the total words W as a function of the number n of hours that the person can encode?
- $W(n) = 1000 + n$
 - $W(n) = \frac{1000}{n}$
 - $W(n) = 1000n$
 - $W(n) = 1000 - n$
8. Judy is earning ₱300.00 per day for cleaning the house of Mrs. Perez and additional ₱25.00 for an hour of taking care Mrs. Perez's child. Express the total salary (S) of Judy including the time (h) spent for taking care the child.
- $S(h) = 300 + 25h$
 - $S(h) = 300 - 25h$
 - $S(h) = 300(25h)$
 - $S(h) = \frac{300}{25h}$
9. Which of the following functions define the volume of a cube?
- $V = 3s$, where s is the length of the edge
 - $V = s^3$, where s is the length of the edge
 - $V = 2s^3$, where s is the length of the edge
 - $V = \frac{s}{3}$, where s is the length of the edge
10. Eighty meters of fencing is available to enclose the rectangular garden of Mang Gustin. Give a function A that can represent the area that can be enclosed in terms of x .
- $A(x) = 40x - x^2$
 - $A(x) = 80x - x^2$
 - $A(x) = 40x^2 - x$
 - $A(x) = 80x^2 - x$

For number 11 - 12 use the problem below.

A user is charged ₱400.00 monthly for a Sun and Text mobile plan which include 500 free texts messages. Messages in excess of 500 is charged ₱1.00. Represent a monthly cost for the mobile plan using $s(t)$ where t is the number of messages sent in a month.

$$s(t) = \begin{cases} 11. \underline{\hspace{2cm}} \\ 12. \underline{\hspace{2cm}} \end{cases}$$

11.

- a. $s(t) = \{400, \text{if } 0 < t \leq 500$
- b. $s(t) = \{400, \text{if } 0 < t \geq 500$
- c. $s(t) = \{400, \text{if } 0 < t < 500$
- d. $s(t) = \{400, \text{if } 0 > t > 500$

12.

- a. $s(t) = 400 + t, \text{if } t > 500$
- b. $s(t) = 400 + t, \text{if } t \leq 500$
- c. $s(t) = 400 + 2t, \text{if } t \geq 500$
- d. $s(t) = 400 + 2t, \text{if } t \leq 500$

For number 13 - 15 use the problem below.

Cotta National High School GPTA officers want to give t-shirts to all the students for the foundation day. They found a supplier that sells t-shirt for ₱200.00 per piece but can charge to ₱18,000.00 for a bulk order of 100 shirts and ₱175.00 for each excess t-shirt after that. Use a piecewise function to express the cost in terms of the number of t-shirt purchase

$$t(s) = \begin{cases} 13. \underline{\hspace{2cm}} \\ 14. \underline{\hspace{2cm}} \\ 15. \underline{\hspace{2cm}} \end{cases}$$

13.

- a. $t(s) = \{200s, \text{if } 0 < s \leq 100$
- b. $t(s) = \{200s, \text{if } 0 \geq s \leq 99$
- c. $t(s) = \{200s, \text{if } 0 > s \leq 100$
- d. $t(s) = \{200s, \text{if } 0 < s \leq 99$

14.

- a. $t(s) = \{18,000, \text{if } s \geq 100$
- b. $t(s) = \{18,000, \text{if } s > 100$
- c. $t(s) = \{18,000, \text{if } s = 100$
- d. $t(s) = \{18,000, \text{if } s < 100$

15.

- a. $t(s) = \{18,000 + 175(s - 100), \text{if } s > 100$
- b. $t(s) = \{18,000 + 175(s - 100), \text{if } s \geq 100$
- c. $t(s) = \{18,000 + 175s, \text{if } s > 100$
- d. $t(s) = \{18,000 + 175s, \text{if } s \leq 100$

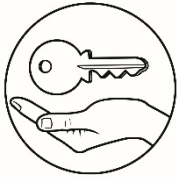


Additional Activities

If you believe that you learned a lot from the module and you feel that you need more activities, well this part is for you.

Read and analyze each situation carefully and apply your learnings on representing real-life situations involving functions including piecewise.

1. Contaminated water is subjected to a cleaning process. The concentration of the pollutants is initially 5 mg per liter of water. If the cleaning process can reduce the pollutant by 10% each hour, define a function that can represent the concentration of pollutants in the water in terms of the number of hours that the cleaning process has taken place.
2. During typhoon Ambo, PAGASA tracks the amount of accumulating rainfall. For the first three hours of typhoon, the rain fell at a constant rate of 25mm per hour. The typhoon slows down for an hour and started again at a constant rate of 20 mm per hour for the next two hours. Write a piecewise function that models the amount of rainfall as function of time.



Answer Key

<p>Assessment</p> <p>1. D 2. B 3. A 4. C 5. C 6. D 7. C 8. A 9. B 10. A 11. A 12. A 13. D 14. C 15. A</p>	<p>What's More</p> <p>Independent Practice 1</p> <p>1. $S(n) = 750n$ 2. $F(d) = 8 + 0.50d$</p> <p>Independent Assessment 1</p> <p>1. $R(t) = 15t$ 2. $V(a) = 48a - 28a^2 + 4a^3$</p> <p>Independent Practice 2</p> <p>1. $c(d) = \begin{cases} 10, & \text{if } d \leq 2 \\ 10 + 8(d), & \text{if } d \geq 3 \end{cases}$ 2. $p(t) = \begin{cases} 25, & \text{if } t \leq 2 \\ 25 + 5t, & \text{if } 12 > t \geq 3 \\ 100, & \text{if } t > 12 \end{cases}$</p> <p>Independent Assessment 2</p> <p>1. $v(n) = \begin{cases} 5,500, & \text{if } n \leq 5 \\ 5,500 + 500n, & \text{if } n > 5 \end{cases}$ 2. $c(g) = \begin{cases} 500, & \text{if } 0 < g \leq 30 \\ 500 + 30g, & \text{if } 50 > g \geq 31 \\ 1000, & \text{if } g \geq 50 \end{cases}$</p>	<p>What I Know</p> <p>1. A 2. B 3. C 4. B 5. D 6. B 7. D 8. C 9. C 10. A 11. D 12. D 13. A 14. B 15. C</p>
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