GENERAL MATHEMATICS 11

Name of Learner: _____   Grade Level: _____

Section: _____   Date: _____

LEARNING ACTIVITY SHEET

EVALUATES A FUNCTION

Background Information for the Learners

In this topic, you will learn about evaluating functions. To evaluate a function is simply to *substitute/replace* a certain variable with a given number or expression, in this case we refer this as the x variable. We then write $f(a)$ to show that f is being evaluated at a for some a in the domain of f.

Example 1.

Evaluate the given functions at $x = 2$

1. $f(x) = 5x + 8$
2. $g(x) = x^2 + 3x - 4$
3. $h(x) = |x + 3| - 2$
4. $t(x) = x^3 - 5x^2$
5. $p(x) = \lceil x \rceil + 5$, where $\lceil x \rceil$ is the smallest integer greater than or equal x.

Solution:

1. $f(2) = 5(2) + 8 = 10 + 8 = 18$
2. $g(2) = (2)^2 + 3(2) - 4 = 4 + 6 - 4 = 6$
3. $h(2) = |2 + 3| - 2 = |5| - 2 = 5 - 2 = 3$
4. $t(2) = (2)^3 - 5(2)^2 = 8 - 20 = -12$
5. $p(2) = \lceil 2 \rceil + 5 = 2 + 5 = 7$

Learning Competency

Evaluates a Function **(GM_M11GM-Ia-2)**

Note: Practice Personal Hygiene protocols at all times

EXERCISE 1

Directions: Evaluate the following functions at $x = 3.5$.   **[1 point each]**

1. $f(x) = 7x - 1$
2. $g(x) = x^2 - 4$
3. $h(x) = |4x - 21| - 2$
4. $t(x) = 2 \cdot 3^{x-1.5}$
5. $s(x) = \sqrt{x^2 - 2x + 4}$
6. $r(x) = -2^{-2x}$
7. $w(x) = 3^{2x-5}$
8. $q(x) = \lfloor x \rfloor + 4$
9. $f(x) = \frac{x+4}{x^2-2}$
10.
$$f(x) = \begin{cases} 5x & , x < 2 \\ x^2 - 1 & , 2 \leq x < 5 \\ x^3 + 2 & , x \geq 5 \end{cases}$$

EXERCISE 2

Directions: Evaluate each function.   **[1 point each]**

1. $f(x) = |x + 2| + 4$, find $f(-8)$
2. $h(x) = 3^{3x-2}$, find $h(2)$
3. $q(x) = 4^{3x}$, find $q(\frac{1}{2})$

For numbers 4-5, use the function below

$$f(x) = x^2 + 5x + 4$$

4. Find $f(2)$
5. Find $f(x + 2)$

For numbers 6-8, use the function below

$$f(x) = \begin{cases} x + 2 & , x \leq -4 \\ \sqrt{16 - x^2} & , -4 < x < 4 \\ 2 - x & , x \geq 4 \end{cases}$$

6. Find $f(-5)$
7. Find $f(2)$
8. Find $f(5)$

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For items 9-10, given $f(x) = \sqrt{x + 4}$,

9. Find $f(x^2 - 4)$
10. Find $\frac{f(x+h)-f(x)}{h}, h \neq 0$

EXERCISE 3

Directions: Solve the given problems   **[3 points each]**

1. An internet café charges P25.00 per hour (or a fraction of an hour) for the first four hours and an extra of P15.00 per hour for each next hour. What is the amount paid for following time?
   a. 2 hrs.
   b. 3. 5 hrs.
   c. 6 hrs.
   d. 7. 2 hrs.

2. In a certain city, the Philippine Statistics Office has recorded a total population of 680, 000 in the year 2018. The population increases at the rate of 0.25% annually. Suppose the rate of increase is constant. Determine the population in the following years.
   a. 10 yrs.
   b. 14 yrs.
   c. 17 yrs.

3. Driving lessons require a rental car fee of P 500. 00 for the first 8 km. and for every kilometer added charges an additional fee of P 50.00. How much will it cost for the following distance.
   a. 7 km.
   b. 9 km.

4. A stone is thrown straight up from a building with a velocity, in m/s, given by $V(t) = 15 - 9.8t$. After t seconds, calculate the following velocities. Make an interpretation of the results.
   a. $V(0)$
   b. $V(1)$

5. In particular bacteria culture, if $p(x)$ bacteria are present at x minutes, then $p(x) = Ae^{0.03x}$ such that A is a constant. Initially, there are 1200 bacteria present, calculate the number of bacteria after:
   a. 30 minutes
   b. 1 hr.
   c. 1.5 hrs.

Note: Practice Personal Hygiene protocols at all times

Reflection:

What have you learned from this topic?

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_____
_____
_____

References:

Verzosa, D.B, et.al (2016). General Mathematics. Quezon City, Manila
Alferez, G. S. (2014). Introduction to Calculus. Quezon City, Manila
Leithold, L. (1996). The Calculus 7. New York City.
https://cdn.kutasoftware.com/Worksheets/Alg2/Evaluating%20Functions.pdf

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Answer Key

Exercise 1

1. 23.5
2. 8.25
3. 5
4. 18
5. 9.25

6. $-\frac{1}{128}$
7. 9
8. 7
9. 0.73
10. 11.25

Exercise 2

1. 10
2. 8
3. 8
4. 18
5. $x^2 + 9x + 18$

6. -3
7. $2\sqrt{3}$
8. -3
9. x
10. $\dfrac{1}{\sqrt{x+h+4} + \sqrt{x+4}}$

Exercise 3

1. a. P50.00
   b. P100.00
   c. P130.00
   d. P160.00

2. a. P = 697, 193
   b. P = 704, 191
   c. P = 709, 485

3. a. P500.00
   b. P550.00

4. a. 15 m/s
   b. 5.2 m/s
   This implies that the initial velocity is 15 m/s and gets more slowly at 5.2 m/s.
5. a. P(x) = 2, 952
   b. P(x) = 7, 260
   c. P(x) = 17, 856

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