GENERAL MATHEMATICS 11

Name of Learner:_____ Grade Level:_____

Section:_____ Score: _____

LEARNING ACTIVITY SHEET

EXPONENTIAL FUNCTION, EXPONENTIAL EQUATION, AND EXPONENTIAL INEQUALITY

Background Information for Learners

Exponential expression is a mathematical expression which contains an exponent. This expression can be written as a•b^{x-c}+d, where a, b and d are constant. The value of b must be greater than 0 but should not be equal to 1 (b>0, b≠0).

In this learning activity sheet, you will distinguish among exponential function, exponential equation and exponential inequality

In order to understand our topic, let us analyze the given example below.

Example

Directions: Evaluate the expression in each item below. What are the similarity/ies or difference/s of the given expressions?

1. $5^{x+1} = 25$ 2. $y= 2^x$ 3. $16 > 8^{3x-1}$

Possible Answers: Items 1,2, and 3 involve expressions with a variable in the exponent. Items 1 and 3 involve only one variable but item 2 involves two variables. Items 1 and 2 involve equality symbol while item 3 involves an inequality symbol.

Points to Ponder:

- **Exponential Function**- is a function that can be written as f(x)=b^x or y=b^x, where b>0, b≠1.
Example: f(x)= 5^{x-1} or y= 5^{x-1}

- **Exponential Equation**- is an equation involving exponential expressions. The base must be constant and its exponent must contain a variable.
Example: $3^{2x+1}=3^{x-5}$

- **Exponential Inequality**- is an inequality that involves exponential expressions. The base must be constant and its exponent must contain a variable.

Example: $2^{6x-3}+2^{2x+5}> 0$

Note: The exponential equation and exponential inequality can be solved for all values of x that will satisfy the equation or inequality while the exponential function will just show us the relationship of two variables.

Solved Examples

Directions: Determine whether the given expression in each item is an exponential equation, exponential inequality, exponential function or none of the above. Write **EE** for exponential equation, **EI** for exponential inequality, **EF** for exponential function and **NA** for none of the above.

1. $y= 4^{x-1}$ (Answer: EF)

2. $8^{3x+1}= x$ (Answer: NA since the base on the right expression is a variable)

3. $5> 25^{x+4}$ (Answer: EI)

4. $100+ 10^{x-5}=0$(Answer: EE)

5. $f(x)= 6^{2(x-5)}$ (Answer: EF)

Learning Competency

Distinguishes among exponential function, exponential equation, and exponential inequality. (**M11GM-Ie-4**)

Exercise 1:

Directions: Fill in each blank with the appropriate mathematical symbol (=, <, >, ≤, ≥) to satisfy the given exponential expression in each item. **[2 points each]**

1. Exponential Equation : 36^{x+1} ____ 6^{x}

2. Exponential Function: y____27^{x+5}

3. Exponential Inequality: 9 ____81^{x+5}

Exercise 2:

Directions: Determine whether the given expression in each item is an exponential equation, exponential inequality, exponential function or none of the above. Write **EE** for exponential equation, **EI** for exponential inequality, **EF** for exponential function and **NA** for none of the above. Write your answer on the space given before the number.

[2 points each]

_____1. $f(x) = 3^{x}$

_____2. $125^{x+1} = 5^{x}$

_____3. $\frac{1}{25} = 5^{x}$ (Hint: $\frac{1}{25}$ can be written also as 5^{-2})

_____4. $81 \leq 3^{x-2}$

_____5. $2^{2-x} \geq 8^{6x}$

_____6. $y = \left(\frac{3}{5}\right)^{4-2X}$

_____7. $f(x) = 25^{2t}$

_____8. $f(x) = 3^{3x}$

_____9. $5^{x} = 125^{2x}$

_____10. $f(x) = 1^{-x}$

Exercise 3:

Directions: Evaluate the given expressions inside the box below. Copy each expression and write this on the table according to its name. **[2 points each]**

$125^{3x+7} = 25^{x-3}$	$y=\frac{1}{81}^{3x+3}$	$7^{2x+4} < 49^{2x-1}$
$\frac{1}{6}^{2x-10} \leq \frac{1}{216}^{x+13}$	$6^{2x-4} \geq 64^{2x+3}$	$f(x)=2^{3x-2}$
$16^{x-5} = 64^{2x-3}$	$y=12^{x+1}$	$12^{5x-1}=144^{x-6}$

Exponential Function	Exponential Equation	Exponential Inequality
1. 2. 3.	1. 2. 3.	1. 2. 3.

Reflection:

What have you learned from this topic?

_____
_____
_____
_____

References of Learners:

http://teachtogether.chedk12.com/teaching_guides/view/14

Verzosa, D.B. , et.al., (2016). General Mathematics for Senior High School (First Edition). Quezon City Manila; Lexicon Press Inc.

Answer Key

Exercise 1

1. =
2. =
3. >, <, ≤, or ≥

Exercise 2

1. EF
2. EE
3. EE
4. EI
5. EI
6. NA
7. EF
8. EF
9. EE
10. NA

Exercise 3

Exponential Function	Exponential Equation	Exponential Inequality
1. $y=\frac{1}{81}^{3x+3}$ 2. $y=12^{x+1}$ 3. $f(x)=2^{3x-2}$	1. $12^{5x-1}=144^{x-6}$ 2. $125^{3x+7} = 25^{x-3}$ 3. $16^{x-5} = 64^{2x-3}$	1. $7^{2x+4} < 49^{2x-1}$ 2. $6^{2x-4} \geq 64^{2x+3}$ 3. $\frac{1}{6}^{2x-10} \leq \frac{1}{216}^{x+13}$