GENERAL MATHEMATICS 11

Name: _____ Grade Level: _____
Date: _____ Score: _____

LEARNING ACTIVITY SHEET

REPRESENTS A RATIONAL FUNCTION THROUGH ITS TABLE OF VALUES, GRAPH, EQUATION

Background Information for Learners

This activity serves as a learning guide for the learners. It facilitates lesson comprehension as it specifically aims for student's mastery in representing rational functions.

Rational functions are expressed in the ratio of two polynomial functions P(x) and Q(x), where P(x)is the numerator and Q(x) is the denominator. The function is defined for all values of the variable except the zeros of Q(x).

There are different ways of representing rational function such as a) table of values b) graph, and c) equation.

Constructing a table of values for a given rational function is vital in sketching its graph. Through the graph of rational function, one can easily grasp the behavior of the function values and also its other characteristics such as zeros, vertical and horizontal asymptotes and intercepts.

Learning Competency: The learner represents a rational function through its: a) table of values, b) graph, c) equation. (GM_M11GM-Ib-4)

Activity 1

Example:

Represents f(x) = $\frac{1}{x}$ by its table of values. Using the values of x from -5 to 5.

Answer:

X	- 5	- 4	- 3	- 2	- 1	0	1	2	3	4	5
f(x)	$-\frac{1}{5}$	$-\frac{1}{4}$	$-\frac{1}{3}$	$-\frac{1}{2}$	-1	Undefined	1	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{5}$

Represents each of the following rational function by its table of values.

a.) f(x) = $\frac{1}{2x}$ b.) g(x) = $\frac{x}{x-1}$ c.) h(x) = $\frac{2}{x+1}$

Directions:
Represent each rational function by its table of values using the values of x from -5 to 5.

a. f(x)=$\frac{1}{2x}$

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
f(x)											

Note: Practice Personal Hygiene protocols at all times

b. $g(x) = \frac{x}{x-1}$

x	-5	-4	-3	-2	-1	0	1	2	3	4	5
g(x)											

c. $h(x) = \frac{2}{x+1}$

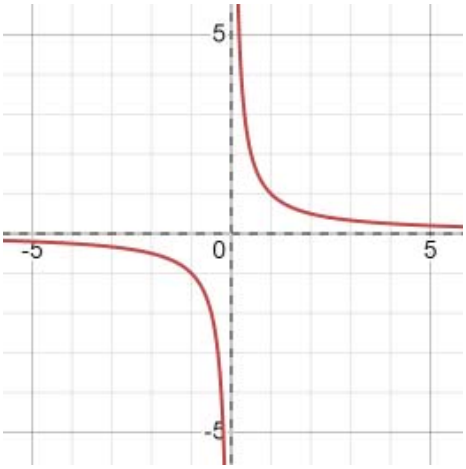
x	-5	-4	-3	-2	-1	0	1	2	3	4	5
h(x)											

Activity 2

Example:

Represents $f(x)=\frac{1}{x}$ by its graph. Then identify the zeros, intercepts and asymptotes.

Answer:



Zeros: none
Intercepts
x-intercepts: none
y-intercepts: none
Asymptotes
Vertical: x=0
Horizontal: y=o

Represents each rational function by its graph.Then identify the zeros,intercepts and asymptotes.

a.) $f(x) = \frac{1}{2x}$ b.) $g(x) = \frac{x}{x-1}$ c.) $h(x) = \frac{x-2}{x+1}$

Activity 3

Example:

Represent this problem in a rational function, then answer what is asked.

In an inter-barangay basketball league, the team from barangay 1 has won 9 out of 20 games a winning percentage of 45%. What would be their winning percentage if they win 5 games consecutively?

Solutions:

Let x be the number of wins of Barangay 1 needs to win in a row. Then the function P is a function of the number of wins that the team needs to win. The function is

$$P(x)= \frac{9+x}{20+x}$$

$$P(5)= \frac{9+5}{20+5} =\frac{14}{25} =.56=56\%$$

Therefore, the winning percentage of Barangay 1, if they win 5 games in a row is 56%

Represent the following problems below in a rational function, then answer what is asked:

1. Consider a 100-meter track used for foot races. The speed of the runner can be computed by taking the time it will take him to run the track. Appling it to the formula of average speed $s=\frac{d}{t}$, what is the rational function represented by the speed as a function of time? What is the speed of the runner in 20 seconds?
2. Let's say you are taking an exam. You already got 18 questions correctly out of 23, which is a grade percentage of 78%.What would be your grade percentage if you got the last 2 consecutive questions correctly?

Answer Key
(Activity 1)

a. $f(x)=\frac{1}{2x}$

x	- 5	- 4	- 3	- 2	- 1	0	1	2	3	4	5
f(x)	$-\frac{1}{10}$	$-\frac{1}{8}$	$-\frac{1}{6}$	$-\frac{1}{4}$	$-\frac{1}{2}$	Undefined	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{6}$	$\frac{1}{8}$	$\frac{1}{10}$

b. $g(x) = \frac{x}{x-1}$

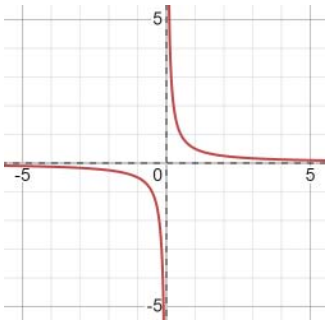
x	- 5	- 4	- 3	- 2	- 1	0	1	2	3	4	5
f(x)	$\frac{5}{6}$	$\frac{4}{5}$	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{1}{2}$	0	Undefined	2	$\frac{3}{2}$	$\frac{4}{3}$	$\frac{5}{4}$

c. $h(x) = \frac{2}{x+1}$

x	- 5	- 4	- 3	- 2	- 1	0	1	2	3	4	5
f(x)	$-\frac{1}{2}$	$-\frac{2}{3}$	- 1	- 2	Undefined	2	1	$\frac{2}{3}$	$\frac{1}{2}$	$\frac{2}{5}$	$\frac{1}{3}$

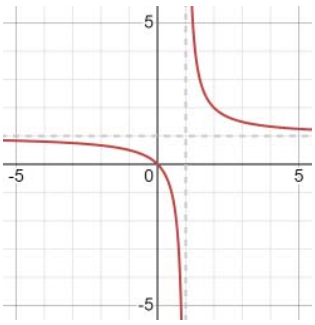
(Activity 2)

a. $f(x) = \frac{1}{2x}$



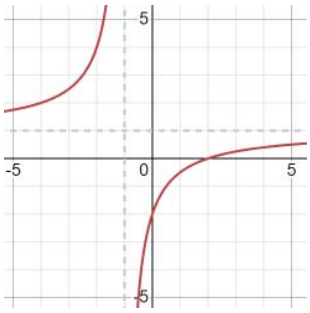
Zeros: none
Intercepts:
x-intercepts: none
y-intercepts: none
Asymptotes:
Vertical: x=0
Horizontal: y=0

b. $g(x) = \frac{x}{x-1}$



Zeros:0
Intercepts:
x-intercepts:(0,0)
y-intercepts:(0,0)
Asymptotes:
vertical: x=1
horizontal: y=1

c. $h(x) = \frac{x-2}{x+1}$



Zeros:2
Intercepts:
x-intercepts:(2,0)
y-intercepts:(0,-2)
Asymptotes:
Vertical: x=-1
Horizontal: y=1

Note: Practice Personal Hygiene protocols at all times

(Activity 3)

1.Solutions:

Let x the time it takes the runner to run 100 meters. Then the function S is a function of the time it takes by the runner to run 100 meters. The function is

$$S(x)= \frac{100}{x}$$

$$S(20)= \frac{100}{20} = 5\text{m/s}$$

Therefore, the speed of the runner for 20 minutes is 5m/s.

2. Solution:

Let x be the additional number of consecutive questions correctly answered. Then the function f is a function of the number of questions that you need to get correctly. The function is

$$f(x)= \frac{18+x}{23+x}$$

$$\mathbf{f}(2)= \frac{18+2}{23+2} = \frac{20}{25} = .8 = 80\%$$

Therefore, your grade percentage , if you got the last 2 questions correctly is 80% .

Reflection:

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References:

GENERAL MATHEMATICS (LM),First Edition 2016, DIWA Senior High School Series:General Mathematics, Next Century Mathematics 11 General Mathematics Copyright 2016, MSA ADVANCED ALGEBRA with Trigonometry