Assessment Sections 1.2 - 1.3 Name_____

1.2.1: I can use the definition of a function and the Vertical Line Test to decide if a relation is/is not a function. I can find the domain and range of a function.

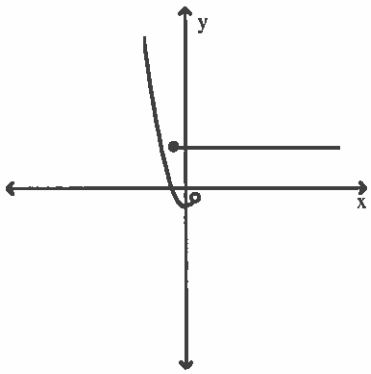
In 1 and 2, determine whether the formula determines y as a function of x. Explain your reasoning. Use a sketch if necessary.

1) $y = -5x^2 - 3x + 1$

2) $y^2 = (x - 7)(x + 5)$

Determine whether the graph is the graph of a function. Show your reasoning on the sketch below.

3)



In 4 and 5, using interval notation, find the domain and range of the function.

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

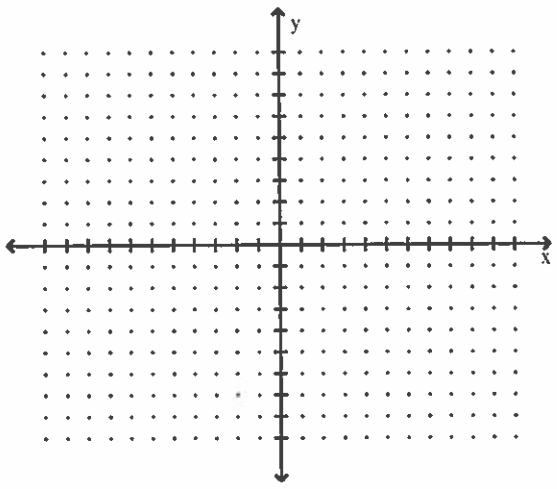
5) $f(x) = \sqrt{2 + x}$

6) **1.2.2: I can identify and describe discontinuities of a function.**

Contract *removable discontinuit* and *nonremovable discontinuity* Provide an equation of each type to show the difference

7) Graph the function and determine if it has a point of discontinuity at $x = 0$. If there is a discontinuity, tell whether it is removable or non-removable.

$$g(x) = \frac{x2 + 5}{x}$$



8) Identify the point of discontinuity and determine whether it is removable or non removable.

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

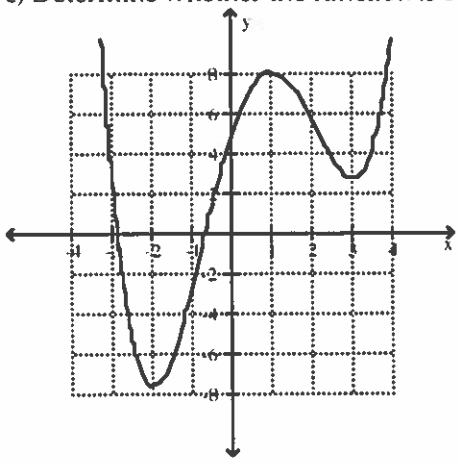
1.2.3: I can identify & describe the interval on which a function is increasing, decreasing, and/or constant. I can also identify a function's extrema and whether the graph is bounded.

9) Use the graph of *f* to:

a) Estimate the extrema. Label each as local or absolute.

b) Determine the intervals on which the function is increasing, decreasing and constant.

c) Determine whether the function is bounded above, bounded below, or unbounded.



Using interval notation, identify intervals on which the function is increasing, decreasing, or constant.

10) $h(x) = |x+2| + |x-8| - 12$

11) Contrast bounded and unbounded graphs. What must be true in order for a function to be considered bounded?

Determine if the function is bounded above, bounded below, bounded on its domain, or unbounded on its domain. Explain your reasoning and provide a sketch if necessary.

12) $y = 5^{-x} + 3$

1.2.4: I can analyze function characteristics such as symmetry, asymptotes, and end behavior.

In 13 & 14, determine algebraically whether the function is even, odd, or neither even nor odd.

13) $f(x) = 2x^5 - 2x^3$

14) $f(x) = -4x^4 - 7x - 8$

Find the asymptote(s) of the given function.

15) $h(x) = \frac{(x-5)(x+1)}{x^2-4}$ vertical asymptotes(s)

ntify the end behavior of the following function as x approaches ∞.

16) $f(x) = 1.9^x$

1.31.: I can recognize the graphs of 12 basic functions and describe the characteristics of each. Identify which of the twelve basic functions listed below fit the description given.

$y = x,\ y = x2,\ y = x3,\ y = |x|,\ y = \frac{1}{x},\ y = ex,\ y = \sqrt{x},\ y = \ln x,\ y = \sin x,\ y = \cos x,\ y = \text{int}(x),\ y = \frac{1}{1+e^{-x}}$

17) The one function that is decreasing from $(0, \infty)$

18) The three functions that are even

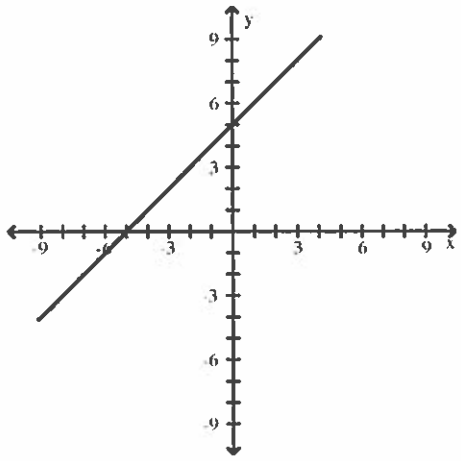
19) The two functions with infinitely many zeros

Graph the function on your calculator in order to answer the following questions:
On what intervals is the function increasing? decreasing?
Is the function odd, even, or neither?
Give the function's extrema, if any.
Find the horizontal asymptotes, if any.
How does the graph relate to a graph of one of the twelve basic functions?

20) $f(x) = \ln(x + 3)$

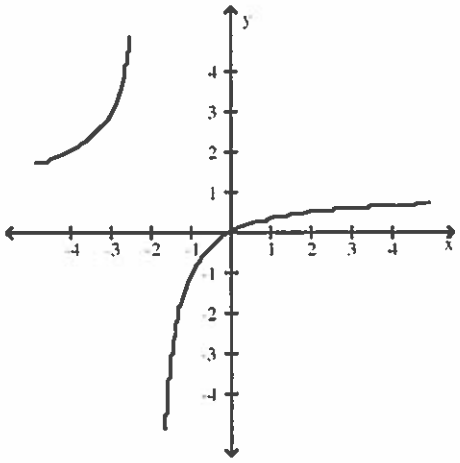
Answer Key
Testname: 1.2-1.3 ASSESSMENT

1) Yes
2) No
3) No
4) [4, ∞)
5) [0, ∞)
6)
7)



Yes; removable

8)



No

9) Local maximum: approx. 8.08; local minima: approx. -7.67 and 2.75
10) Increasing: (8, ∝); decreasing: (-∞, -2); constant: (-2, 8)
11)
12) Bounded below
13) Odd
14) Neither
15) x = 2, x = -2
16) y = 0
17) $y = \frac{1}{x}$
18) y = x2, y = cos x, y = |x|
19) y = sin x, y = cos x
20) Increasing on(-3, ∝)
    Neither odd nor even
    No extrema
    No horizontal asymptotes
    Graph is graph of f(x) = ln x shifted 3 units to the left