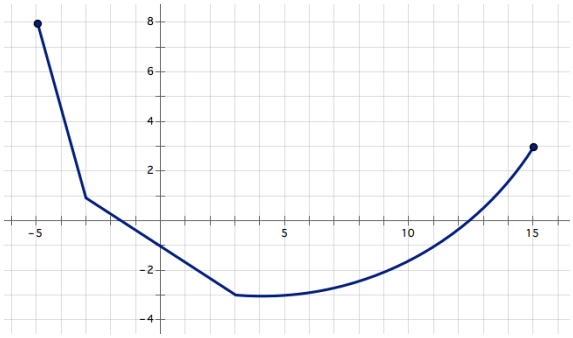
Name:_____ **Period:**_____

Mod 3 Review

List Key Features of the following functions:

1.

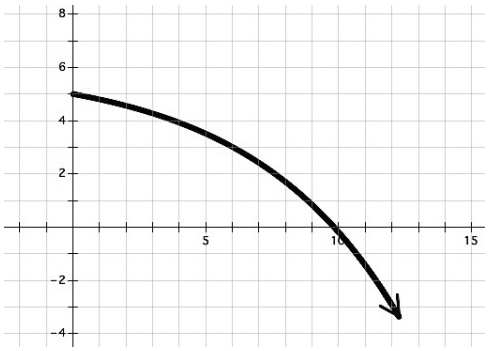


intervals:
- Domain: [-5, 15]
- Range: [-3, 8]
- inc: [3, 15]
- dec: [-5, 3]
- constant: none
- CROC: [-5, -3] [-3, 3]

points:
- min: (3, -3)
- max: (-5, 8)
- x-int: (-1.5, 0) (12.5, 0)
- y-int: (0, -1)

continuous

2.

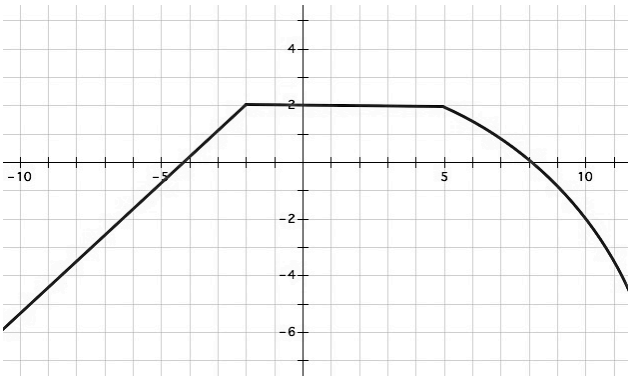


intervals:
- Domain: [0, ∞)
- Range: (-∞, 5]
- inc: none
- dec: [0, ∞)
- constant: none
- CROC: none

points:
- min: none
- max: (0, 5)
- x-int: (10, 0)
- y-int: (0, 5)

continuous

3.

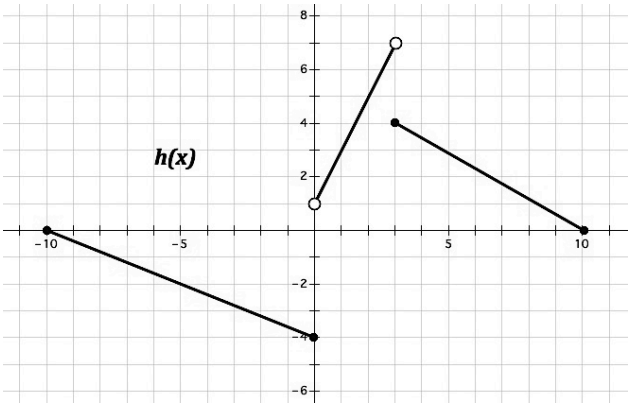


intervals:
- domain: (-∞, ∞)
- Range: (-∞, 2]
- inc: (-∞, -2]
- dec: [5, ∞)
- constant: [-2, 5]
- CROC: (-∞, -2]

points:
- min: none because it goes forever down
- max: none because it is constant at y=2
- x-int: (-4.25, 0) (8, 0)
- y-int: (0, 2)

continuous

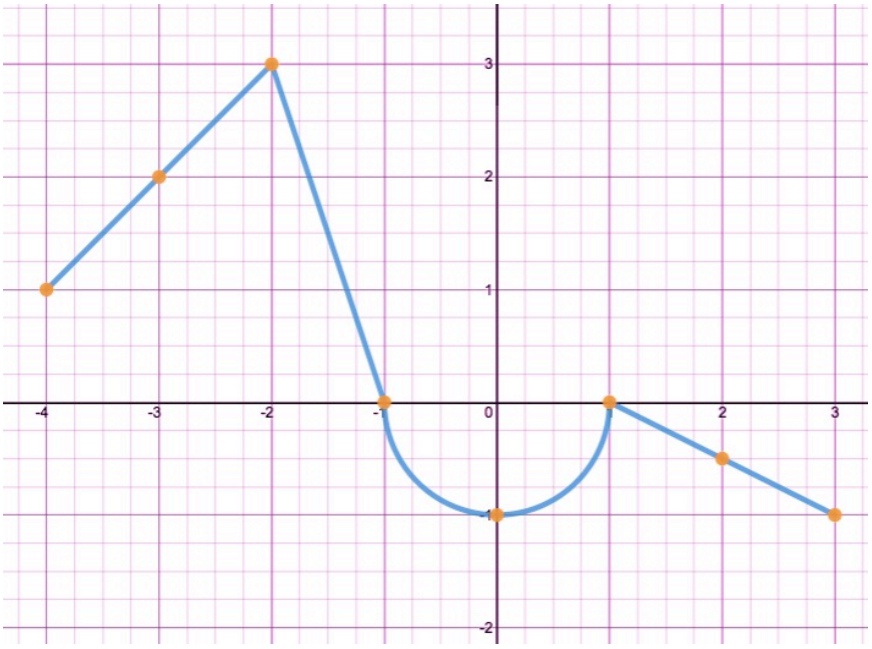
4.



intervals:
- domain: [-10, 10]
- range: [-4, 7]
- inc: (0, 3)
- dec: [-10, 0] [3, 10]
- constant: none
- CROC: [-10, 0] (0, 3) [3, 10]

points:
- min: (0, -4)
- max: none - does not exist at (3, 7)
- x-int: (-10, 0) (10, 0)
- y-int: (0, -4) - does not exist at (0, 1)

discontinuous



Answer the following questions using the graph f(x) shown above.

5. What is the domain of the graph? (in set notation and interval notation)

Set: $\{x \mid x \in \mathbb{R}, -4 \le x \le 3\}$ interval: $[-4, 3]$

6. Find the following values:

a. f(-3) = 2 b. f(0) = -1 c. f(1) = 0 d. f(-1.5) = 1.5

7. Find the x-value for each of the given outputs:

a. If f(x)=3, x= -2 b. If f(x)= 0, x= -1 or 1 c. If f(x)= -1, x= 0

8. What is the minimum? the maximum? (0, -1) (3, -1)

9. What is happening on the interval [1, 3]? constant rate of change, decreasing

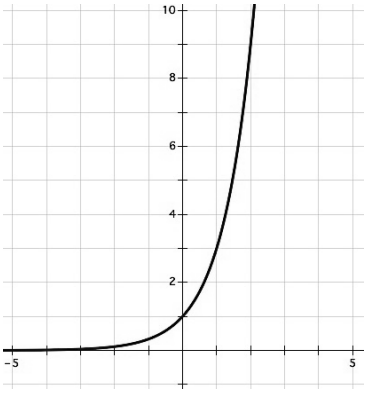
10. On what intervals is the function increasing? $[-4, -2]$ $[0, 1]$

11. List all the intercepts. x int: (-1, 0) (1, 0) y int: (0, -1)

12. Over what interval(s) is there a constant rate of change? $[-4, -2]$ $[-2, -1]$ $[1, 3]$

13. Is this function continuous, discrete, or discontinuous? How do you know? continuous - it is all connected.

14. g(x)



a. $g(2) =$ 9

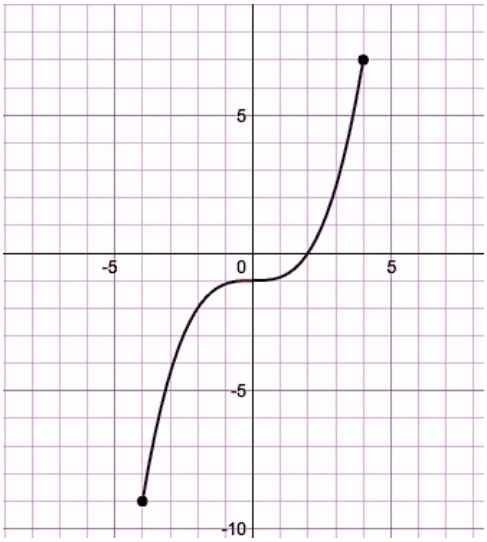
b. $g(x) = 3$, $x =$ 1

c. $g(0) =$ 1

d. What is the explicit rule for $g(x)$

$g(x) = 3^x$

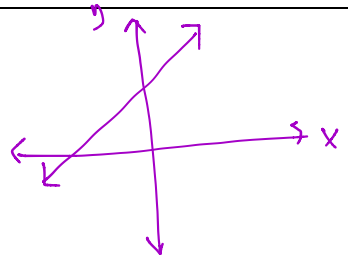
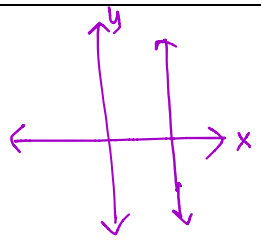
Answer the following questions using the graph g(x) on below.



15. Find the following values:
    a. g(2) = 0
    b. g(0) = -1
    c. g(4) = 7
    d. g(-3) = -4

16. Find the x-value for each of the given outputs.
    a. If g(x) = 1, x= 2.5
    b. If g(x) = -2, x= -2
    c. If g(x) = 7, x= 4
    d. If g(x) = -9, x= -4

17.

Representation	Example of Function	Counter example
Table	Input / Output: 0→5, 1→7, 2→9, 3→11	Input / Output: 0→5, 1→7, 2→9, 2→11
Set of Ordered pairs		
Map	Input: 1, 2, 3, 4 → Output: 5, 6, 7, 8	input: 1, 2, 3 → output: 4, 5, 6, 7
Graph		
Equation	y=2x+5 f(x)= 2x+5	x=5
Context	Distance vs. Time	A person's social security number with respect to a person's name.

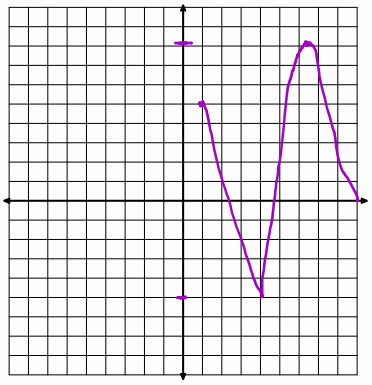
18. What is the definition of a function?

A relation where each input has exactly one output

Given the descriptions below, sketch a possible graph of the function. There is more than one possible correct answer.

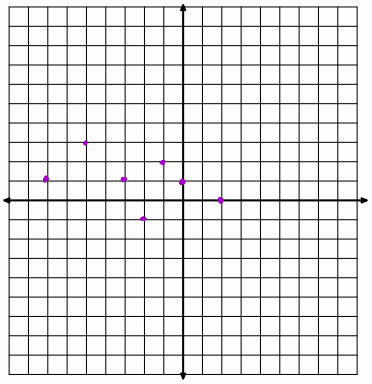
19.

a. The function has a minimum at -5.
b. The function has a maximum at 8.
c. The function has two intervals on which it is decreasing and one interval on which it is increasing.
d. The Domain of the functions contains all Real numbers from 1 to 9.



20.

a. This function is not continuous anywhere.
b. The function contains only seven elements in its domain.
c. The values of the domain are between -10 and 2.
d. The values of the range are between -1 and 3.



21. List the key features of a linear function

If continuous
D: $(-\infty, \infty)$
R: $(-\infty, \infty)$
can increase or decrease
Will have a constant rate of change over the entire domain
no minimum or maximum
has at most one x intercept and y intercept

22. List the key features of an exponential function

If continuous
D: $(-\infty, \infty)$
R: $(0, \infty)$
can increase or decrease
Will not have a constant rate of change but it will have a constant Ratio
no minimum or maximum point but it will have a boundary line at the x-axis
no x-intercept
At most, one y-intercept

23. List the similarities and differences between the key features of linear and exponential functions.

Similarities	Differences
- Domain - Will increase or decrease over entire domain - no maximum or minimum point - Both have at most 1 y-int	- Range - Linear will have a constant rate of change but exponential will not. - Exponential has a boundary line - Linear has at most 1 x-int but exponential has none