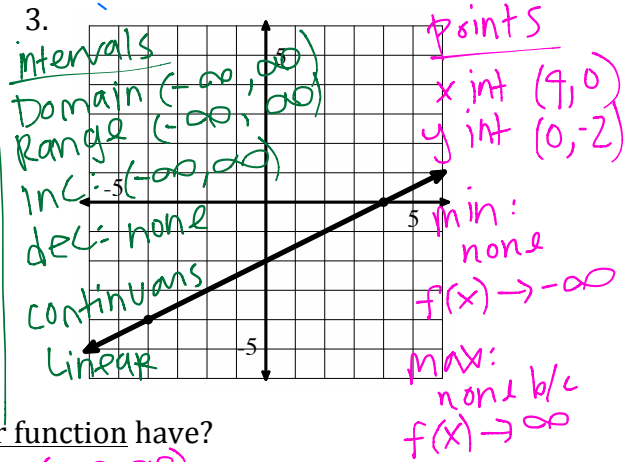
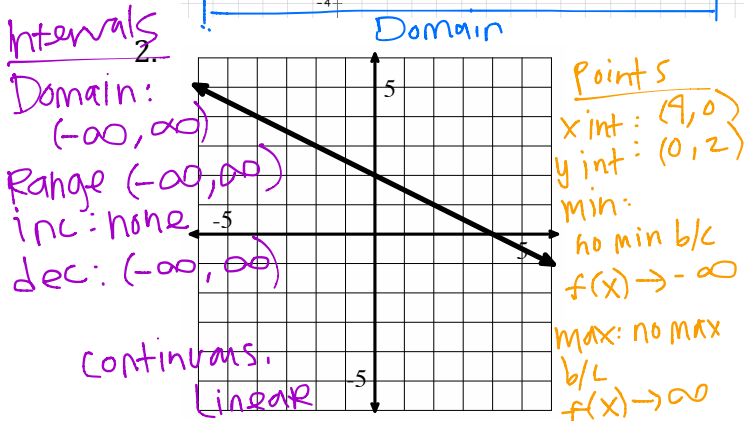
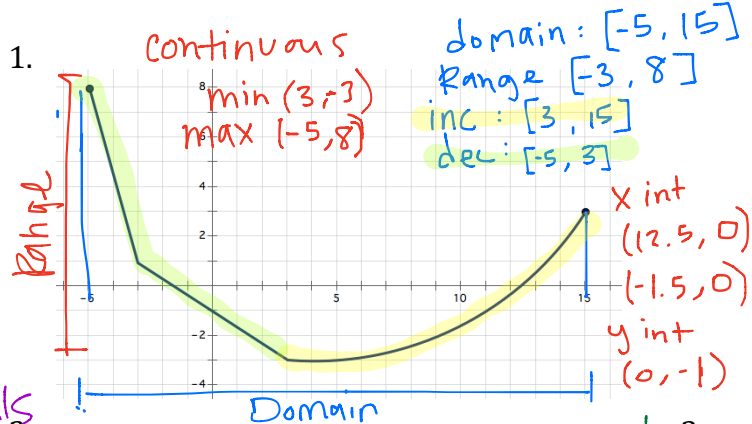


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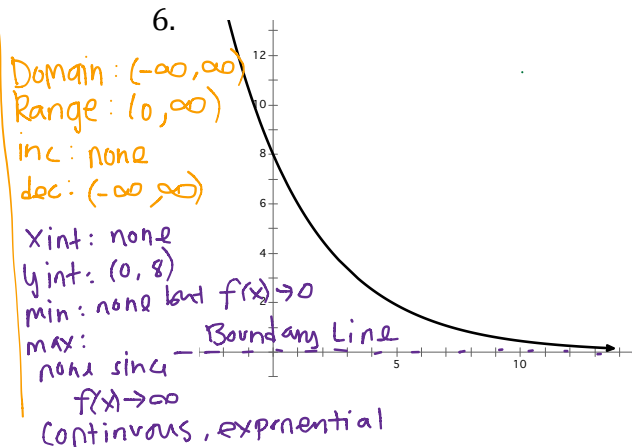
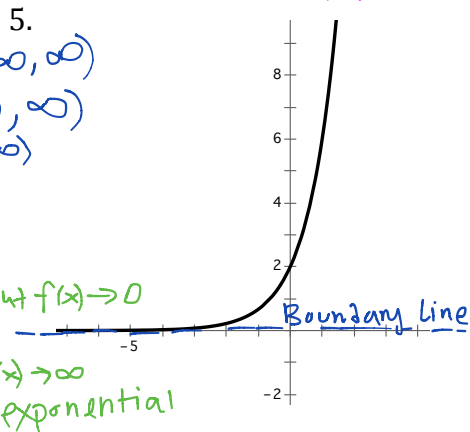
Mod 3 Review

List Key Features of the following functions. Include **domain** and **range**, **increasing** and **decreasing**, **x** and **y intercepts**, and **max** and **min**, and **discrete**, **continuous** or **discontinuous**. This list will not be provided on the test. You must memorize the key features.



4. What features would every continuous linear function have?

- a) Domain: $(-\infty, \infty)$ Range: $(-\infty, \infty)$
- b) ~~Increasing, decreasing~~: Always increasing or decreasing \rightarrow it doesn't change direction
- c) x-intercept: Always has one y-intercept: Always has one y-int
- d) Max: no max b/c $f(x) \rightarrow \infty$ Min: no min b/c $f(x) \rightarrow -\infty$



7. What features would every continuous exponential function ($y = br^x$) have?

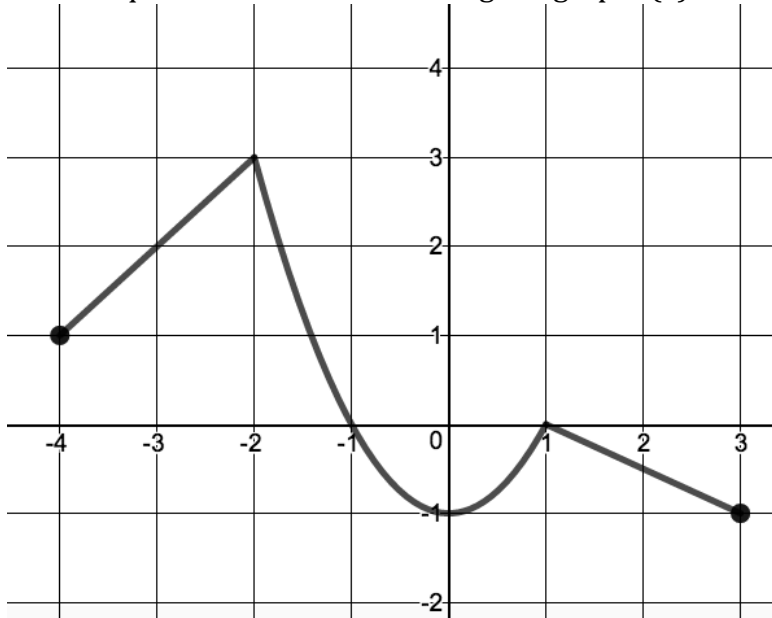
- a) Domain: $(-\infty, \infty)$ Range: $(0, \infty)$
- b) ~~Increasing, decreasing~~: Always either increasing or decreasing \rightarrow Exponential graphs don't switch directions
- c) x-intercept: none y-intercept: Always one y-int
- d) Max: no max b/c $f(x) \rightarrow \infty$ Min: no min b/c of boundary line

8. What are the similarities and differences between continuous linear and exponential functions?

sim: domain $(-\infty, \infty)$
 either inc/dec
 no min or max only one y int

diff: Range
 Exp don't have x int
 constant ratio vs constant rate of change / diff

Answer questions 9-17 below using the graph $f(x)$ shown.



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

Interval: $[-4, 3]$ Set: $\{x | x \in \mathbb{R}, -4 \leq x \leq 3\}$

10. Find the following values:

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

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

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

12. What is the minimum? the maximum?

$(0, -1)$ $(3, -1)$

13. What is happening on the interval $[1, 3]$?

Decreasing, has constant rate of change

14. On what intervals is the function increasing?

$[-4, -2]$ $[0, 1]$

15. List all the intercepts.

x int: $(1, 0)$ $(-1, 0)$ y int: $(0, -1)$

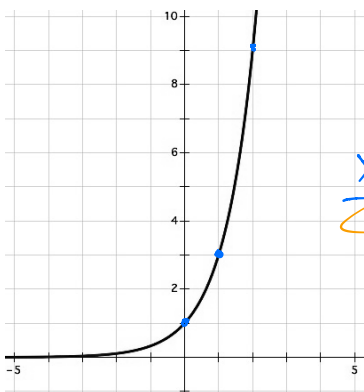
16. Over what interval(s) is there a constant rate of change?

$[-4, -2]$ $[1, 3]$

17. Is this function continuous, discrete, or discontinuous? How do you know?

Continuous b/c you can draw it w/o picking up finger

18. $g(x)$



x	y
0	1
1	3
2	9

2×3

a. $g(2) = 9$

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

c. $g(0) = 1$

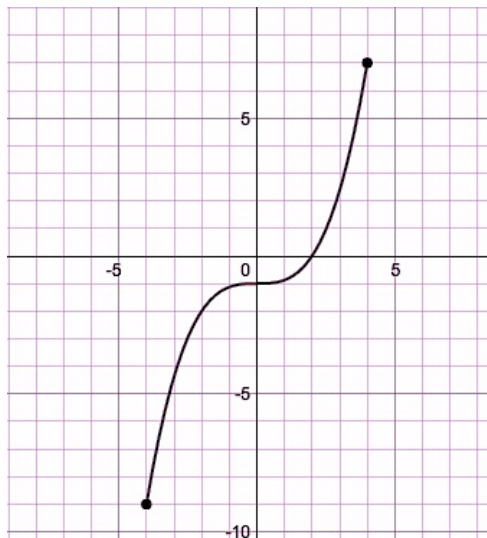
d. What is the explicit rule for $g(x)$

$g(x) = a \cdot b^x$

$g(x) = 1 \cdot 3^x$

$g(x) = 3^x$

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



19. Find the following values:

- a. $h(2) = 0$
- b. $h(0) = -1$
- c. $h(4) = 7$
- d. $h(-3) = -4$

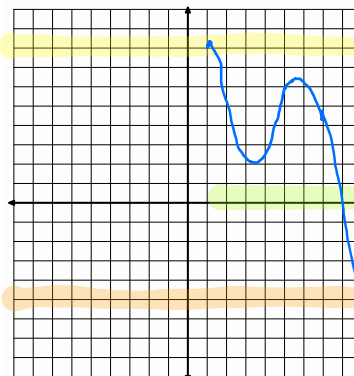
20. Find the x-value for each of the given outputs.

- a. If $h(x) = 1$, $x = 2.5$
- b. If $h(x) = -2$, $x = -2$
- c. If $h(x) = 7$, $x = 4$
- d. If $h(x) = -9$, $x = -4$

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

21.

- 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.

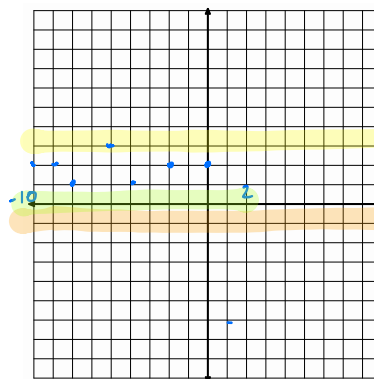


* Answers will vary

22.

- 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.

a.k.a discrete



23. What is the definition of a function?

exactly one output for each input

Fill out the table below with your own examples and non-examples of functions.

*Answers will vary

Representation	Example of Function	Counter example																				
Table	<table border="1"> <thead> <tr> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3</td> </tr> <tr> <td>2</td> <td>6</td> </tr> <tr> <td>3</td> <td>8</td> </tr> <tr> <td>4</td> <td>5</td> </tr> </tbody> </table>	Input	Output	1	3	2	6	3	8	4	5	<table border="1"> <thead> <tr> <th>Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>3</td> </tr> <tr> <td>2</td> <td>6</td> </tr> <tr> <td>2</td> <td>8</td> </tr> <tr> <td>3</td> <td>5</td> </tr> </tbody> </table>	Input	Output	1	3	2	6	2	8	3	5
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Set of Ordered pairs	$\{(1,2), (2,3), (3,5)\}$	$\{(1,2), (2,3), (2,0)\}$																				
Map																						
Graph																						
Equation	$y = 2x + 1$	$x = -5$																				
Context	A person's name as a function of their SSN	A person's SSN as a function of their name																				