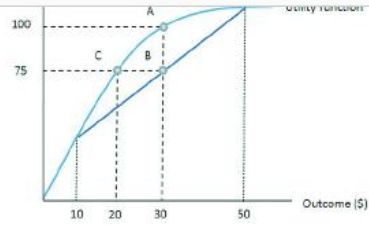
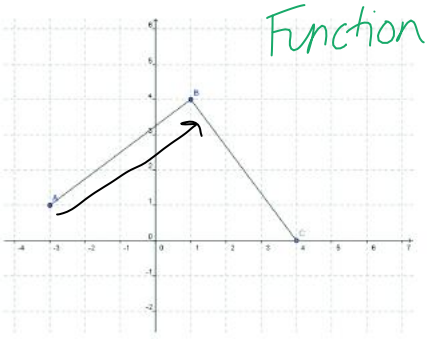
3.3 Features of Functions

A Practice Understanding Task



For each graph, determine if the relationship represents a function, and if so, state the key features of the function (*key features include intercepts, intervals where the function is increasing or decreasing, relative maximums and minimums, ~~symmetries~~, domain and range, and end behavior).*

1.



Function

Incr: $(-3,1)$ Decr: $(1,4)$

Const: none x-int: $(4,0)$

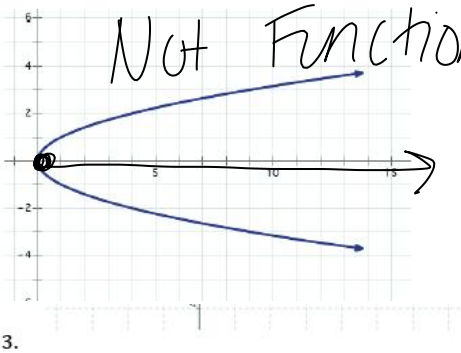
y-int: $(0,3)$ Dom: $[-3,4]$

Range: $[0,4]$ Abs. Max: $(1,4)$

Abs Min: $(4,0)$ Rel Max none

Rel Min: $(-3,1)$ EB: none

2.



Not Function

Incr: Decr:

Const: x-int:

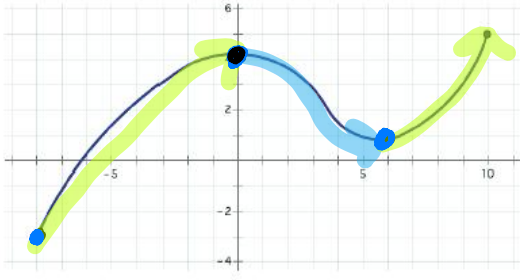
y-int: Dom: $[0,\infty)$

Range: Abs. Max:

Abs Min: Rel Max

Rel Min: EB:

3.



Incr: $(-8,0)$ $(6,10)$ Decr: $(0,6)$

Const: none x-int: $(-6,0)$

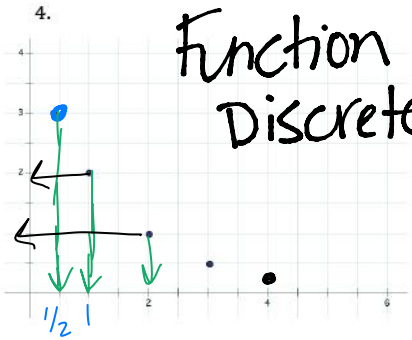
y-int: $(0,4)$ Dom: $[-8,10]$

Range: $[-3,5]$ Abs. Max: $(10,5)$

Abs Min: $(-8,-3)$ Rel Max $(0,4)$

Rel Min: $(6,1)$ EB: none

4.



Incr: none Decr: none

Const: none x-int: none

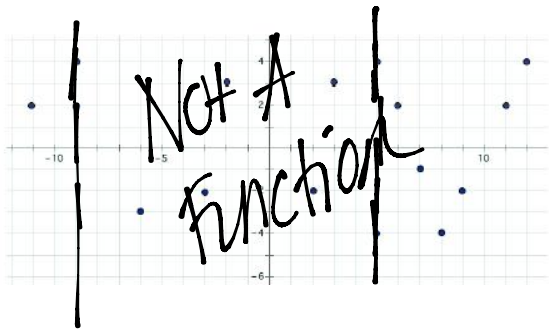
y-int: none Dom: $\{\frac{1}{2}, 1, 2, 3, 4\}$

Range: $\{0.25, 0.5, 1, 2, 3\}$ Abs. Max: $(\frac{1}{2}, 3)$

Abs Min: $(4, 0.25)$ Rel Max none

Rel Min: none EB: none

5.



Incr: Decr:

Const: x-int:

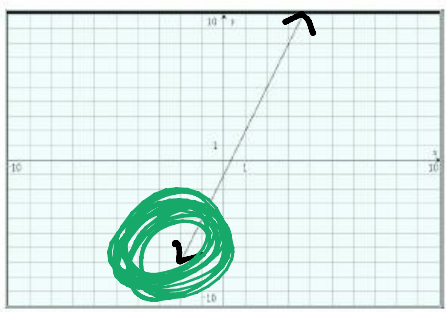
y-int: Dom:

Range: Abs. Max:

Abs Min: Rel Max

Rel Min: EB:

6.



Incr: $(-\infty, \infty)$ Decr: none

Const: none x-int: $(\frac{1}{2}, 0)$

y-int: $(0, -1)$ Dom: $(-\infty, \infty)$

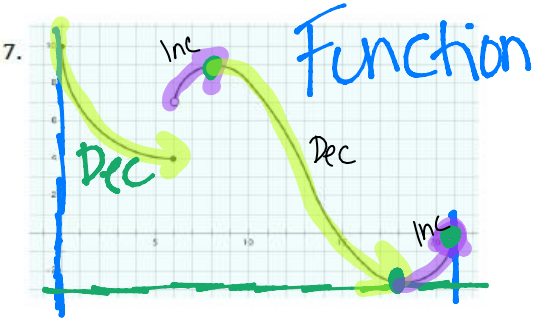
Range: $(-\infty, \infty)$ Abs. Max: none

Abs Min: none Rel Max none

Rel Min: none EB: $x \to -\infty$ (L) $x \to \infty$ (R)

$y \to -\infty$ $y \to \infty$

7.



Incr: Decr:

Const: none x-int: (15,0) (21,0)

y-int: Dom: [0,21]

Range: [-3, 10] Abs. Max:

Abs Min: Rel Max

Rel Min: EB: none

8. The table on the right represents a continuous function defined on the interval from [0, 6].

a) Determine the domain, range, x and y intercepts.

b) Based on the table, identify the minimum value and where it is located.

x	$f(x)$
0	2
1	-3
2	0
3	2
4	6
5	12
6	20

y-int

x-int

Min

Domain
[0, 6]
$0 \le x \le 6$
$\{0,1,2,3,4,5,6\}$

Range
$[-3, 20]$
$-3 \le y \le 20$
$\{-3,0,2,6,12,20\}$

9. The table represents a discrete function defined on the interval from [1,5].

a) Determine the domain, range, x and y intercepts.

b) Based on the table, identify the minimum value and where it is located.

x	$f(x)$
1	4
2	10
3	5
4	8
5	3

none

Dom
$\{1,2,3,4,5\}$

Range
$\{3,4,5,8,10\}$

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Tell what the **domain** and **range** are for the following scenarios.

10. The amount of daylight (in hours) dependent on the month of the year.

Domain: Month yr Range: Daylight (hours)

12. Marcus bought a $900 couch on a six months, interest free payment plan. He makes $50 payments to the loan each week.

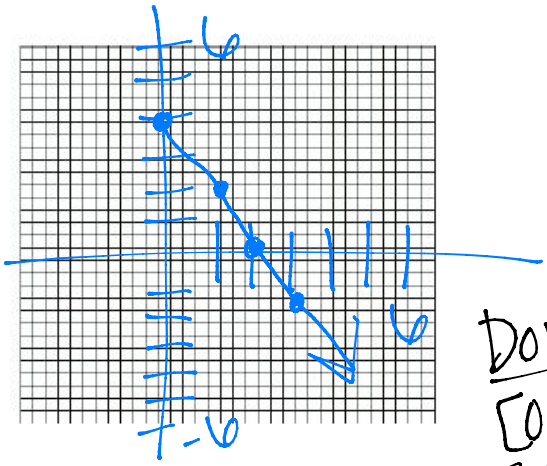
Domain: wks Range: $

14. An empty 15 gallon tank is being filled with gasoline at a rate of 2 gallons per minute.

Dom: Mins Range: Galls

For each equation, sketch a graph and describe the key features of the graph.

15. $f(x) = -2x + 4, when\ x \geq 0$



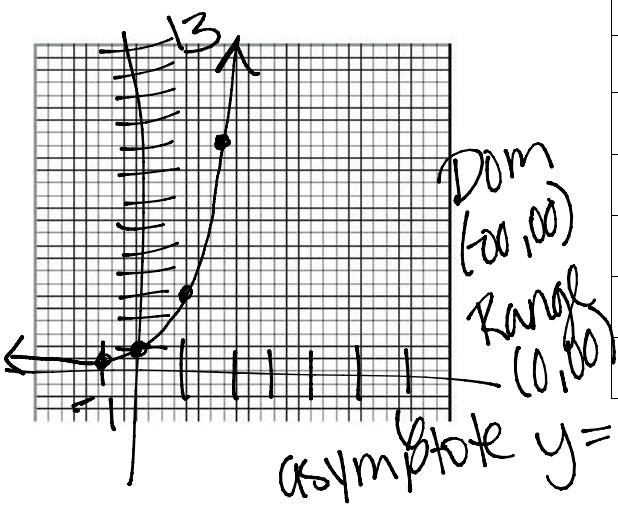
x	y
0	4
1	2
2	0
3	-2
4	-4
5	-6

Dom [0,∞)
Range: (-∞,4]

Why did you start the x values at 0 here?

only work about positive x-values

16. $g(x) = 3^x$



x	y
-1	1/3
0	1
1	3
2	9
3	27
4	81

Dom (-∞,∞)
Range (0,∞)
asymptote y=0