

## How to Read a Graph

You will

Graphically determine if a function is even, odd or neither.

Read the domain and range from a graph.

Determine the y-value given an x-value.

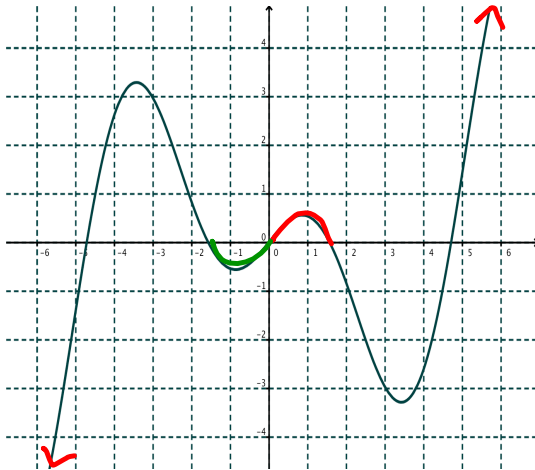
Determine x-value(s) given a y-value.

Interpret graphs which have meaning.

EX 1 Determine the domain and the range for each of these graphs.  
 Domain and range are listed as  $(a,b)$  or  $[a,b]$  etc. where  $a < b$   
 (left to right and lower to upper on the number line.)  
 Is the function even or odd or neither?

The domain and range are given in interval notation (of the form  $(a,b)$  or  $[a,b]$ , etc where  $a < b$ .)  
 In the interval,  $a$  is to the left of  $b$  on the  $x$ -axis and  $a$  is below  $b$  on the  $y$ -axis.

a)

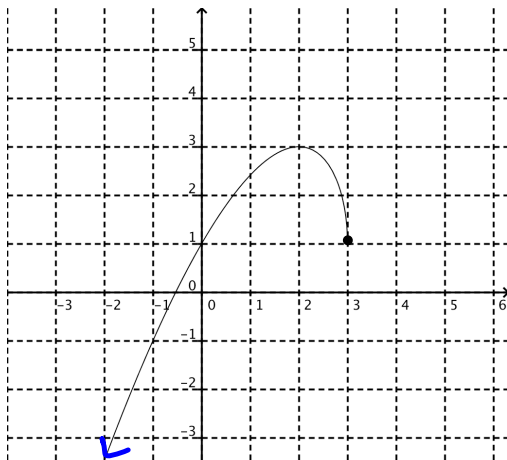


Domain:  $x \in (-\infty, \infty)$

Range:  $y \in (-\infty, \infty)$

Even/Odd/Neither: **odd**

b)

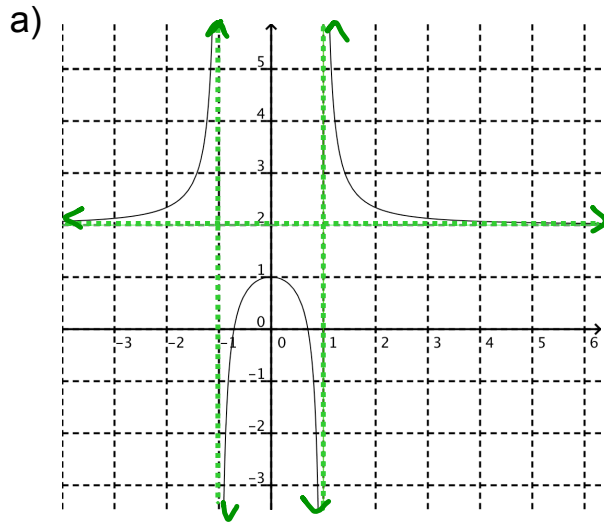


Domain:  $x \in (-\infty, 3]$

Range:  $y \in (-\infty, 3]$

Even/Odd/Neither: **neither**

EX 2 Determine the domain and the range for each of these graphs. Is the function even or odd or neither? Are there any vertical or horizontal asymptotes? Write the equations of the asymptotes if they exist. Remember, domain (least , greatest) or [lowest, highest].



Asymptotes: VA:  $x = -1, x = 1$   
 HA:  $y = 2$

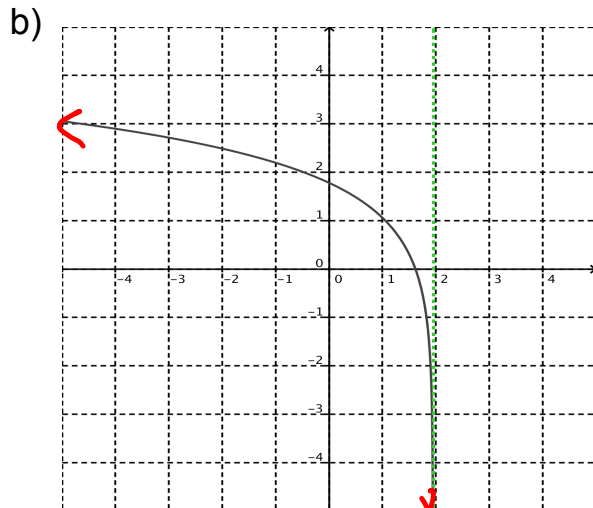
Domain:  
 $x \in (-\infty, -1) \cup (-1, 1) \cup (1, \infty)$

Range:  
 $y \in (2, \infty) \cup (-\infty, 1)$

This is equivalent to  $(-\infty, 1) \cup (2, \infty)$  if you scan from bottom top.

Even/Odd/Neither:

Even  
 (symmetry across y-axis)



Asymptotes: VA:  $x = 2$

Domain:  $x \in (-\infty, 2)$

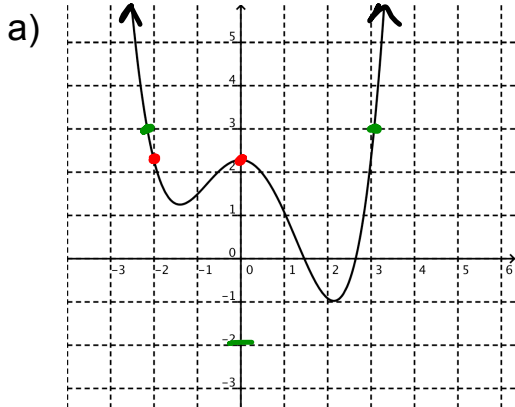
Range:  $y \in (-\infty, \infty)$

Even/Odd/Neither:

(no symmetry) neither

EX 3 Read the values (approximately) from the graph.

Watch closely in the video to the difference between = and  $\approx$ .



Graph of  $f(x) = y$

$f(-2) \approx 2.2$

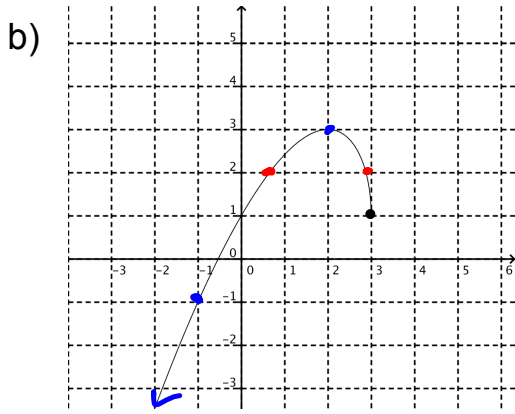
$f(0) \approx 2.2$

$f(x) = 3$  at  $x \approx -2.1, 3.1$

$f(x) = -2$  at  $x$  ~~is~~

this pt DNE

$\approx$  means approximately because we rounded it.



Graph of  $g(x) = y$

$g(-1) = -1$

$g(2) = 3$

$g(4) =$

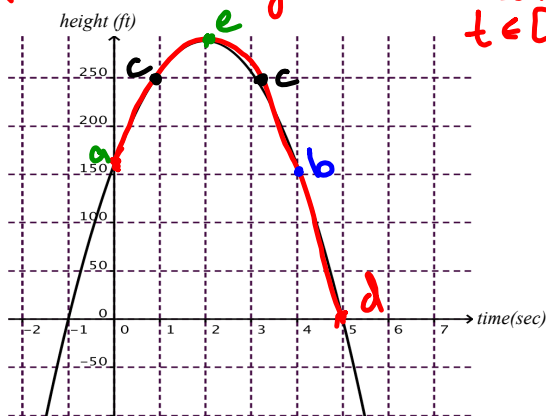
$g(4)$  DNE

$g(x) = 3$  at  $x = 2$

$g(x) = 2$  at  $x \approx 0.7, 2.9$

EX 4 This graph represents the height of an object shot straight up in the air from the edge of a tall building. The x-axis is time in seconds, the y-axis is height in feet off the ground.

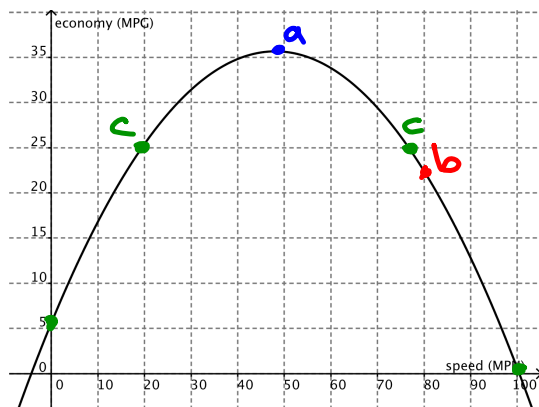
(we are only concerned w/ piece of graph in Q1)  
 $t \in [0, 5]$



- a) How high is the building? 150 ft
- b) How high is the object at 4 sec? 150 ft
- c) When is the object at a height of 250? 1 sec and 3 sec
- d) When does it hit the ground? 5 sec and ~3 sec
- e) How high does it go? ~300 ft

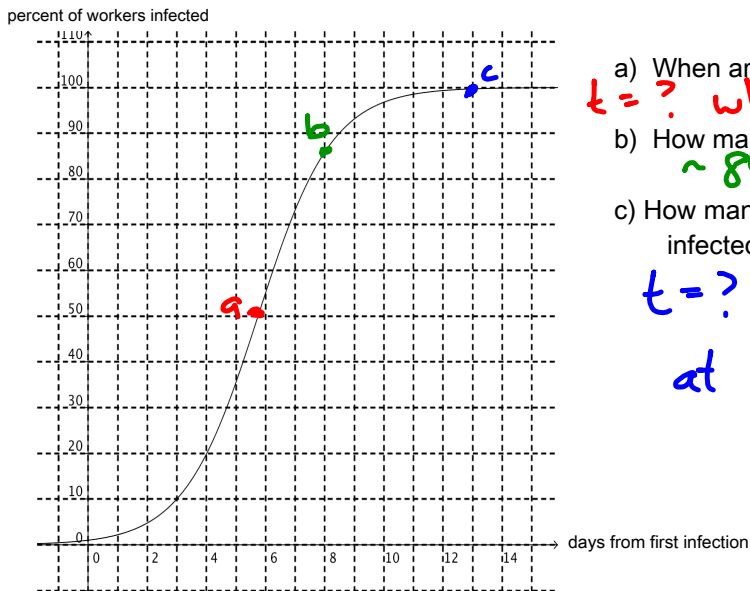
EX 5 This graph represents (approximately) the fuel economy of a car depending on how fast one drives.

(only interested in Q1 graph)



- a) At what speed does one get the best mpg? (highest) ~48 mph
- b) What mpg do you get at 80 mph? ~22 mpg
- c) How fast do you drive to get 25 mpg? ~20 mph or 78 mph

EX 6 This graph represents the percent of factory workers who catch a virus as a function of the number of days. Approximate answers by reading the graph.



a) When are half the students infected?  $\sim 5.7$  days  
 $t = ?$  when  $y = 50$

b) How many are infected by the 8th day?  
 $\sim 85\%$  of factory workers

c) How many days does it take for everyone to be infected?

$t = ?$  when  $y = 100$   
 at 13 days