

Bell Work

Given the following function:
Find the vertical and horizontal asymptotes.
Is there a hole?

$$h(x) = \frac{2x - 4}{x^2 - 4}$$

$$\frac{2(x-2)}{(x+2)(x-2)}$$

hole
 $x = 2$

$x + 2 = 0$
 $x = -2$

VA
HA $y = 0$

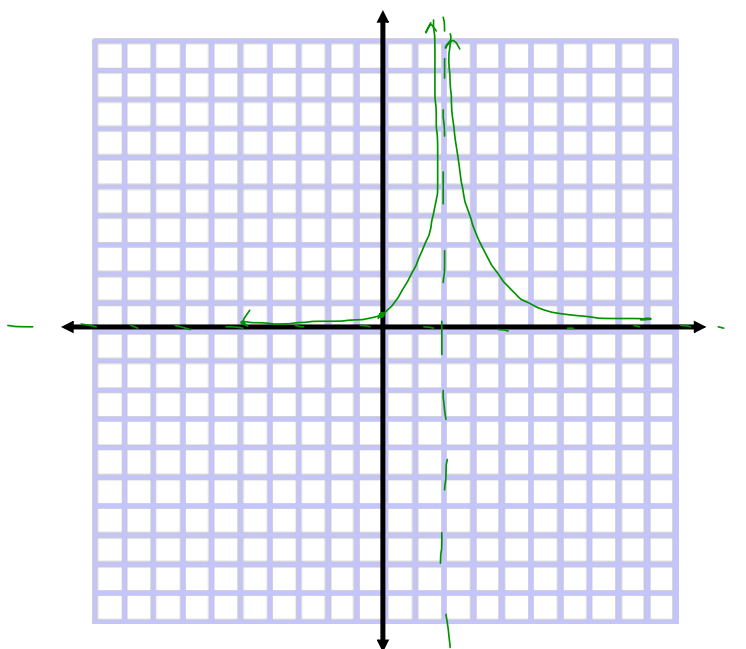
$$20) f(x) = \frac{1}{(x-2)^2}$$

$$VA: x=2$$

$$HA: y=0$$

x-int: None

y-int: $(0, \frac{1}{4})$



25)

$$h(x) = x^3 - 5$$

Test odd/even
substitute $(-x)$

$$h(x) = (-x)^3 - 5$$

$$h(x) = -x^3 - 5$$

neither

33)

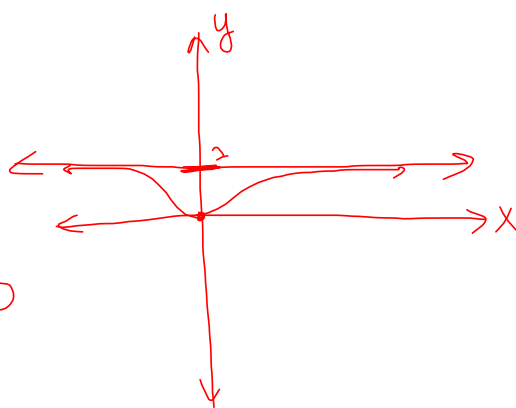
$$f(x) = \frac{x^2}{(x^2 + 1)}$$

$$HA \Rightarrow y = 1$$

$$x^2 + 1 = 0$$

$$x^2 = -1$$

$$x = \pm i$$



$$30) f(x) = \frac{x^2 - 2x}{x} = \frac{\cancel{x}(x-2)}{\cancel{x}}$$

$x=0$

Find the vertical and horizontal asymptotes without your calculator. 😊

$$1. y = \frac{2x^2}{x^2 - 9}$$

$$4. y = \frac{x^2}{3(x^2 - 1)}$$

$$2. y = \frac{x^3 + 3x - 4}{2 - x}$$

$$5. g(x) = \frac{4x - 4}{2x^2 + x - 3}$$

$$3. y = \frac{4}{x^2 + 2}$$

$$6. f(x) = \frac{4x - 2}{4x^2 - 1}$$

Quiz 1.2 A Day 2

Name _____

Find all maxima and minima and the values of x where they occur.

1. $h(x) = -x^3 + 2x - 3$

Find all horizontal and vertical asymptotes.

2. $y = \frac{x + 2}{2x + 1}$

Quiz 1.2 B Day 2

Name _____

Find all maxima and minima and the values of x where they occur.

1. $h(x) = x^3 - 4x + 1$

Find all horizontal and vertical asymptotes.

2. $y = \frac{x + 2}{3 - x}$

Twelve Basic Functions

1. Nine of the functions have domain the set of all real numbers. Which three do not?

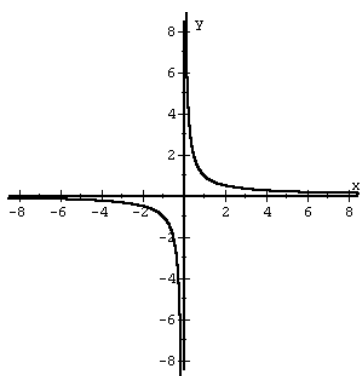
2. One of the functions has domain the set of all reals except 0. Which function is it and why isn't zero in its domain.?

3. Which two functions have no negative numbers in their domains? Of these two, which one is defined at zero?

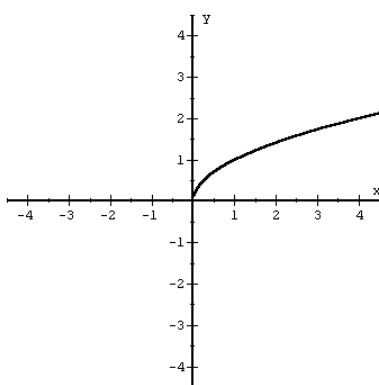
4. Only three of the twelve basic functions are bounded (above and below), which three?

5. Three of the twelve basic functions are even. Which are they?

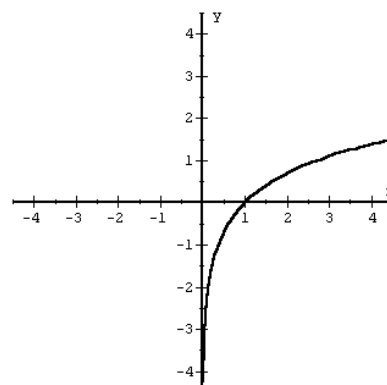
1.



$$y = 1/x$$



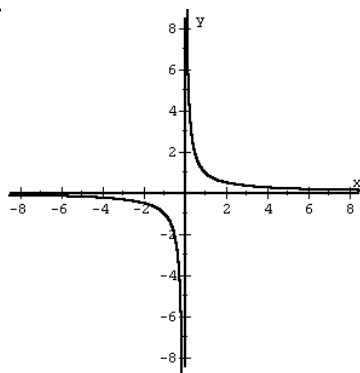
$$y = \sqrt{x}$$



$$y = \ln x$$

These functions do not have all reals as their domain.

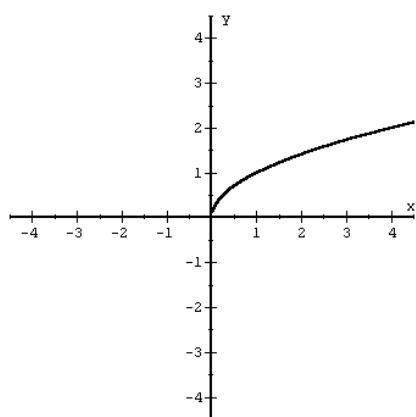
2.



$$y = 1/x$$

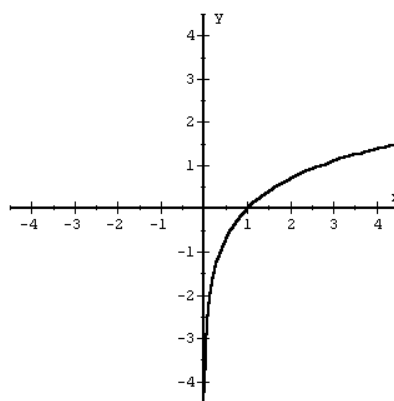
Domain is all reals except 0.
Division by zero is undefined.

3.



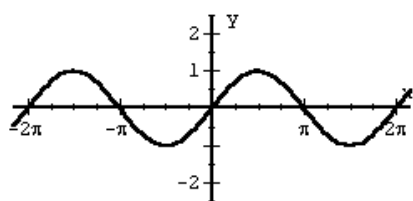
$$y = \sqrt{x}$$

Defined at 0

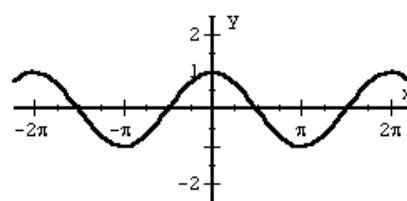


$$y = \ln x$$

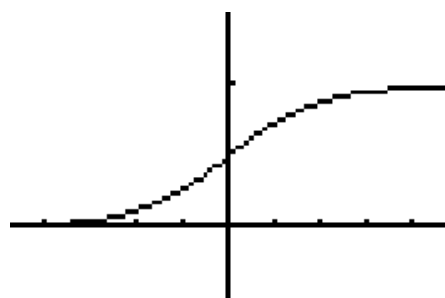
4.



$$y = \sin x$$



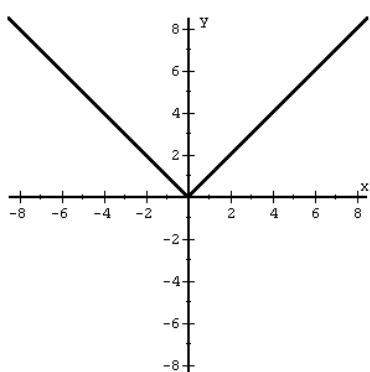
$$y = \cos x$$



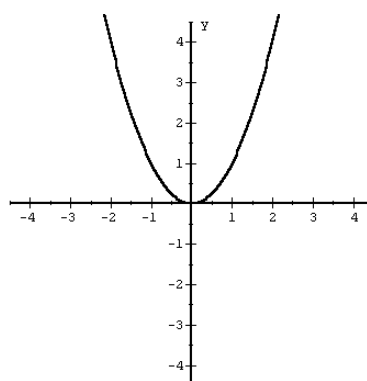
$$y = \frac{1}{1 + e^{-x}}$$

All three of these basic functions are bounded.

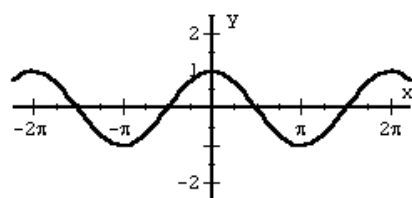
5.



$$y = |x|$$



$$y = x^2$$

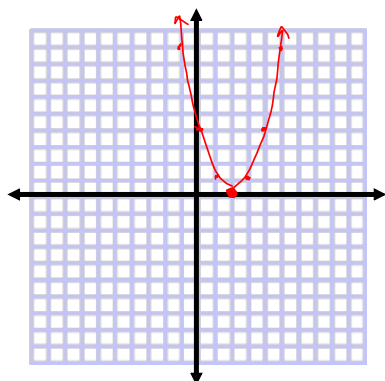


$$y = \cos x$$

All three of these basic functions are even.

Analyze a Function Graphically

Graph the function $y = (x - 2)^2$. Then answer the following questions.

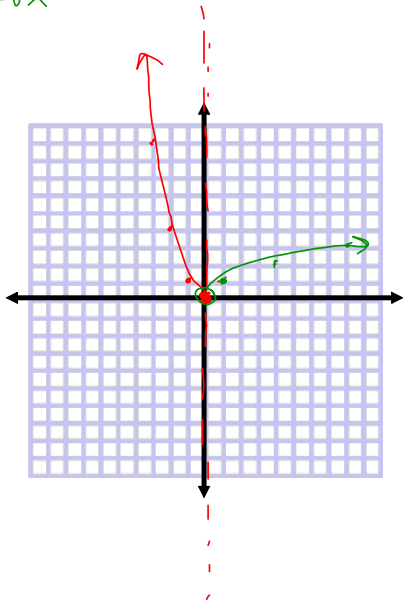


- a) On what interval is the function increasing?
Decreasing? *increase $(2, \infty)$
decrease $(-\infty, 2)$*
- b) Is the function odd or even?
None
- c) Does the function have any extrema?
min $(2, 0)$
- d) How does the graph relate to the basic function $y = x^2$?
shift right 2

Construct a piecewise function

$$f(x) = \begin{cases} x^2 & \text{if } x \leq 0 \\ \sqrt{x} & \text{if } x > 0 \end{cases}$$

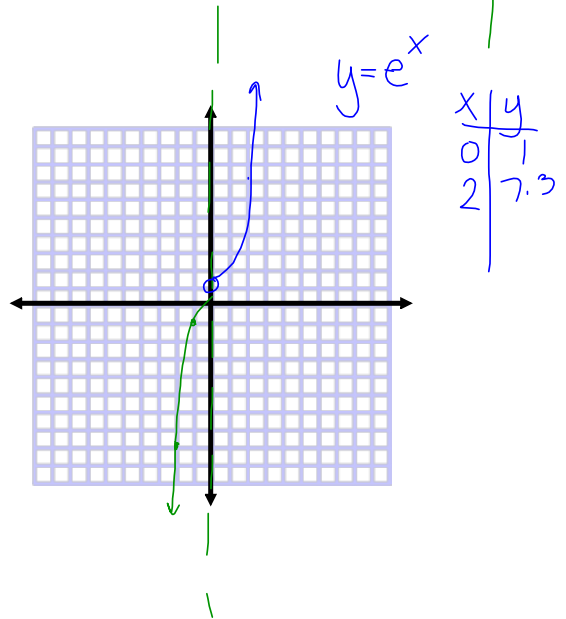
$y = x^2$
 $y = \sqrt{x}$



$$g(x) = \begin{cases} x^3 & \text{if } x \leq 0 \\ e^x & \text{if } x > 0 \end{cases}$$

$y = x^3$

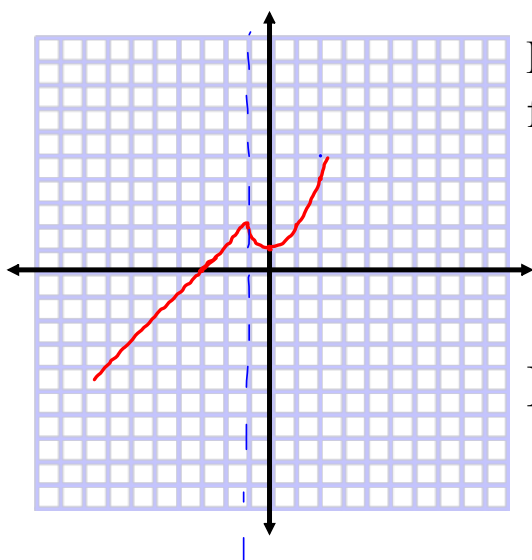
x	y
-1	-1
-2	-8



Given the following piecewise function $f(x)$:

$$y = mx + b$$

$$y = a(x-h)^2 + k$$



Define $f(x)$ algebraically using the basic functions.

$$f(x) = \begin{cases} 1x + 3 & \text{if } x \leq -1 \\ x^2 + 1 & \text{if } x > -1 \end{cases}$$

Evaluate: $f(1) = 2$

$$f(-3) = 0$$

$$f(0) = 1$$

Assignment:

Section 1.3 Pg. 113

QR 1-10

Ex. 1-51odd, 60-63

