

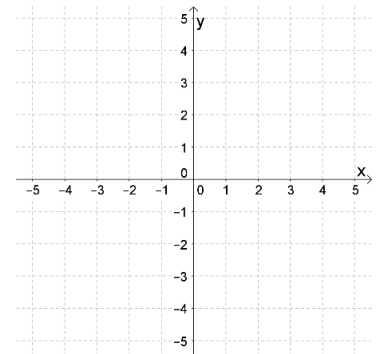
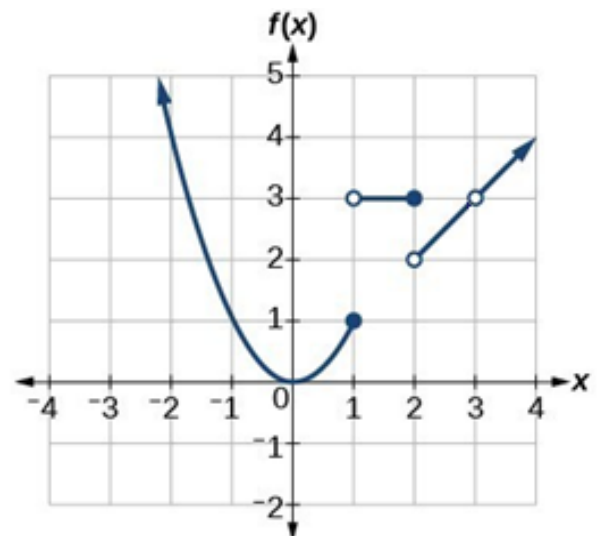
Due date: _____

Name: _____

Tools for Limits (Part 1)

Notes

ex: $f(x) = \frac{1}{x-1}$

Evaluating Functions1. Given the function $f(x) = 2x^2 - 5x - 3$ a) Evaluate $f(0)$ b) Evaluate $f(1)$ c) Evaluate $f(-2)$ 2. Given the graph of $f(x)$, find the following.a) $f(-2) =$ b) $f(0) =$ c) $f(1) =$ d) $f(2) =$ e) $f(3) =$ f) For what x -values does $f(x) = 1$?

Notes

$\frac{1}{0}$ is _____ $\frac{0}{1} =$ _____

$2^0 =$ _____ $e^0 =$ _____ $e^1 \approx$ _____

$\ln 1 =$ _____ $\ln e =$ _____

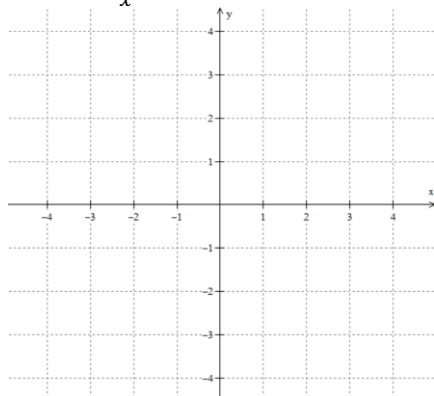
$\sin 0 =$ _____ $\cos 0 =$ _____ $\tan 0 =$ _____

$\tan^{-1} 0 =$ _____ $\tan^{-1} 1 =$ _____

Graphs of Basic Functions (These graphs are all very important and need to be memorized).

3. Graph the following functions. Label intercepts and asymptotes. Find the domain and range.

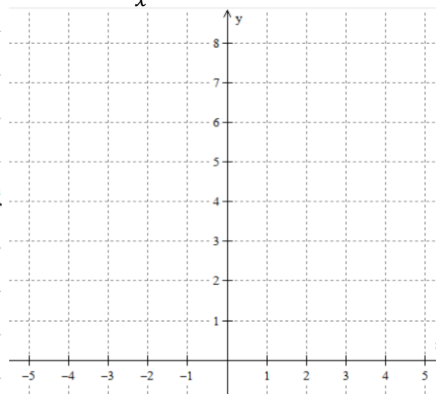
a) $y = \frac{1}{x}$



Domain:

Range:

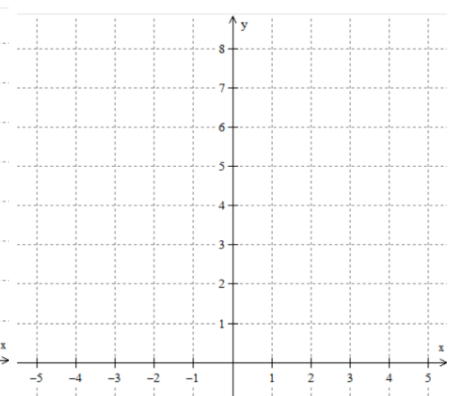
b) $y = \frac{1}{x^2}$



Domain:

Range:

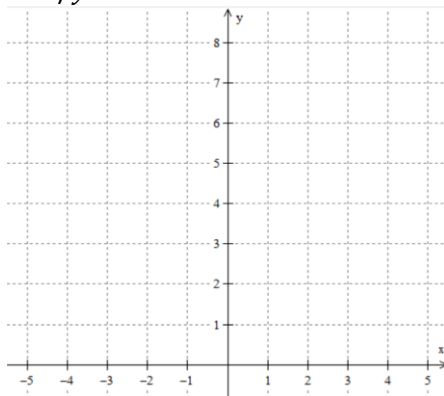
c) $y = |x|$



Domain:

Range:

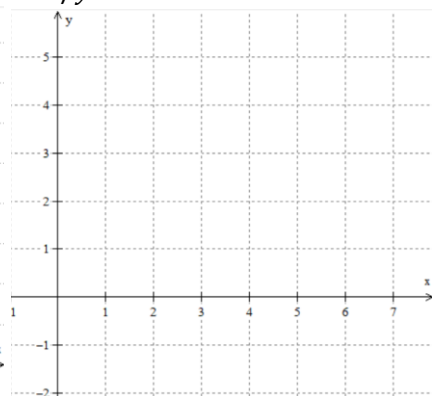
d) $y = e^x$



Domain:

Range:

e) $y = \ln x$



Domain:

Range:

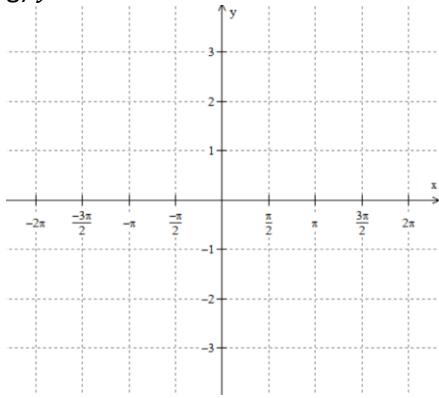
f) $y = \arctan x$ (or $\tan^{-1} x$)



Domain:

Range:

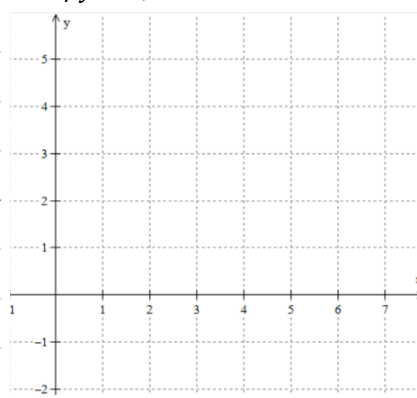
g) $y = \sin x$



Domain:

Range:

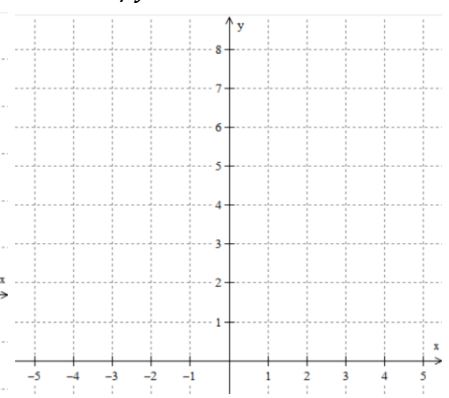
h) $y = \sqrt{x}$



Domain:

Range:

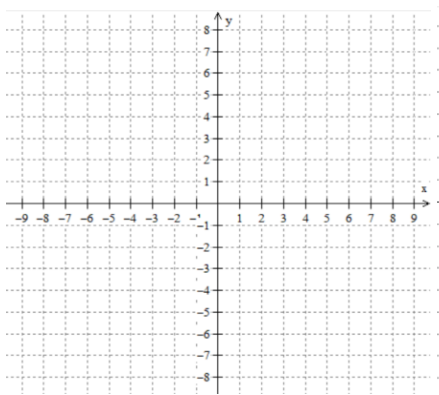
i) $y = x^2$



Domain:

Range:

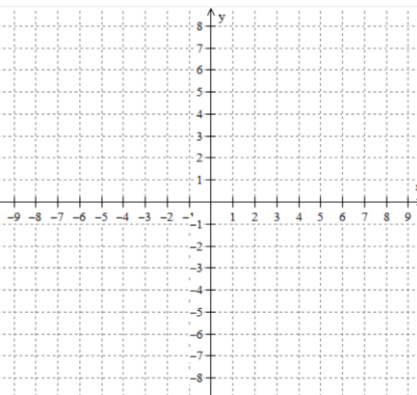
j) $y = x^3$



Domain:

Range:

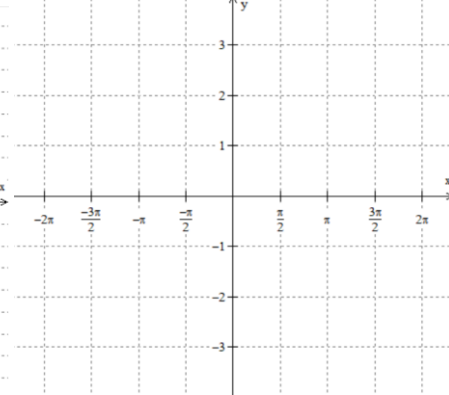
k) $y = \sqrt[3]{x}$



Domain:

Range:

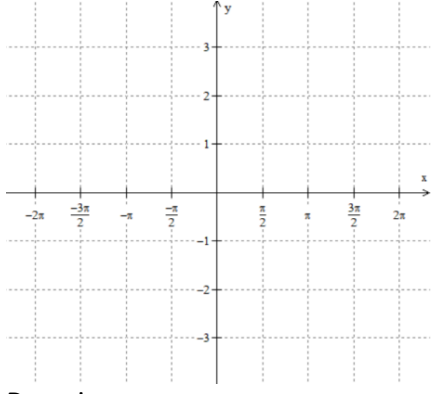
l) $y = \cos x$



Domain:

Range:

m) $y = \tan x$



Domain:

Range:

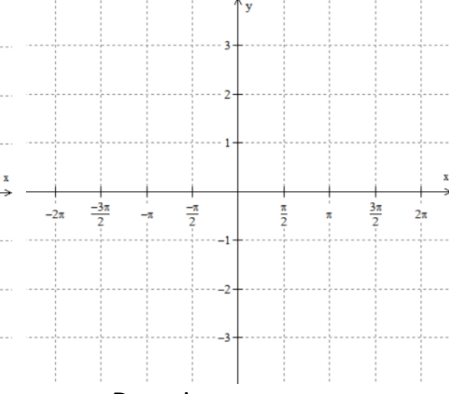
n) $y = \sec x$



Domain:

Range:

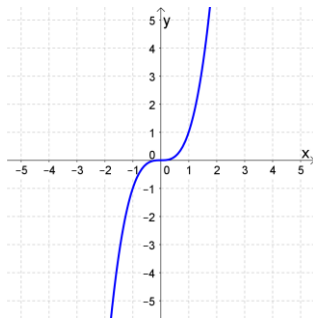
o) $y = \csc x$



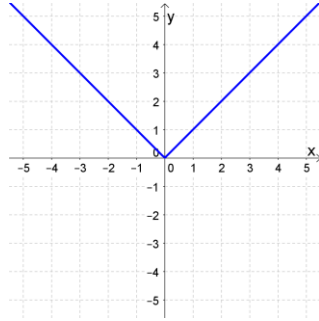
Domain:

Range:

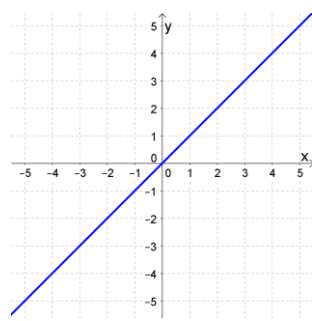
4. Write formulas for the following common graphs.



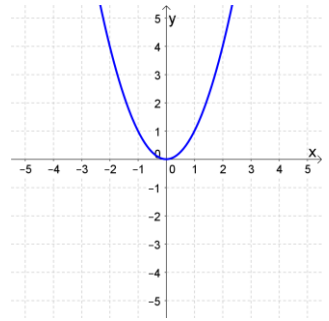
$f(x) = \underline{\hspace{2cm}}$



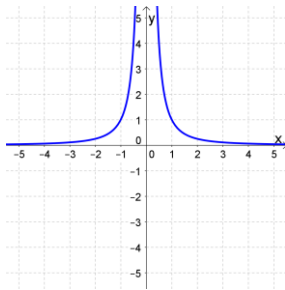
$f(x) = \underline{\hspace{2cm}}$



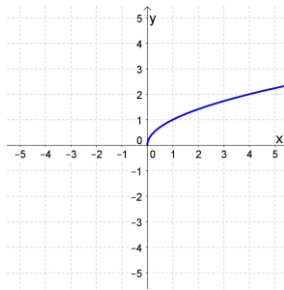
$f(x) = \underline{\hspace{2cm}}$



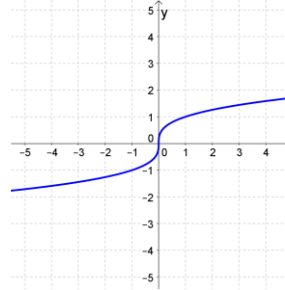
$f(x) = \underline{\hspace{2cm}}$



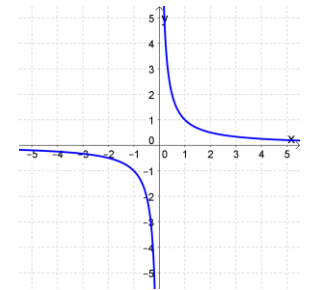
$f(x) = \underline{\hspace{2cm}}$



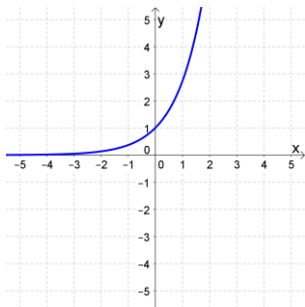
$f(x) = \underline{\hspace{2cm}}$



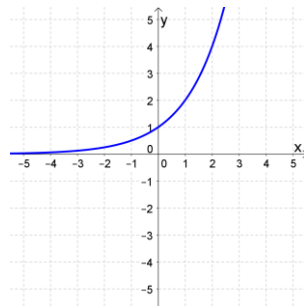
$f(x) = \underline{\hspace{2cm}}$



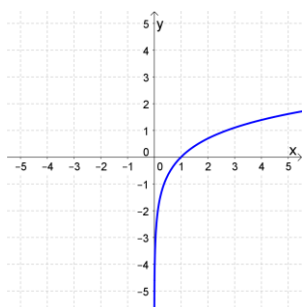
$f(x) = \underline{\hspace{2cm}}$



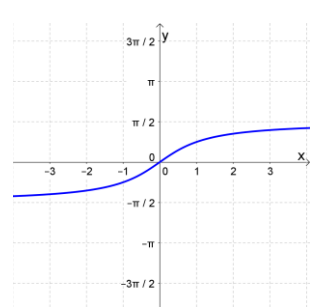
$f(x) = \underline{\hspace{2cm}}$



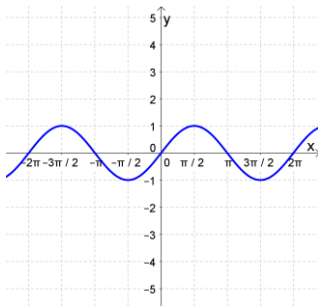
$f(x) = \underline{\hspace{2cm}}$



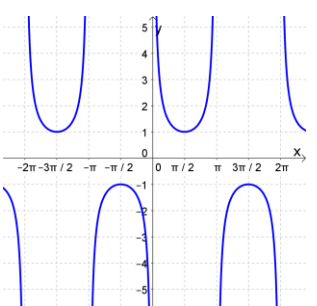
$f(x) = \underline{\hspace{2cm}}$



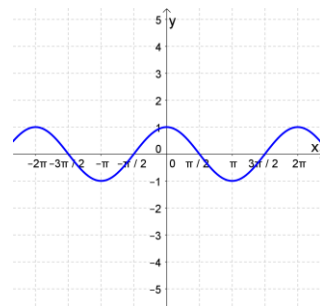
$f(x) = \underline{\hspace{2cm}}$



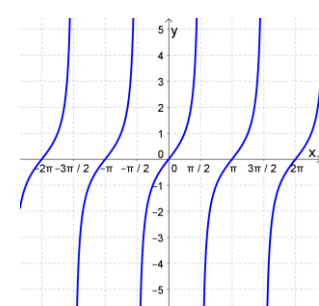
$f(x) = \underline{\hspace{2cm}}$



$f(x) = \underline{\hspace{2cm}}$



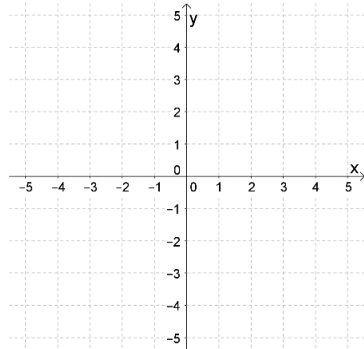
$f(x) = \underline{\hspace{2cm}}$



$f(x) = \underline{\hspace{2cm}}$

Notes

ex: $f(x) = -|x - 2| + 3$



Function Transformations

For a function $f(x)$, and $c > 0$,

$f(x) + c$ shifts up

$f(x) - c$ shifts down

$cf(x)$ stretches vertically (if $c > 1$),
or shrinks vertically (if $0 < c < 1$)

$-f(x)$ reflects about x -axis

$f(x - c)$ shifts right

$f(x + c)$ shifts left

$f(cx)$ stretches horizontally (if $0 < c < 1$),
or shrinks horizontally (if $c > 1$)

$f(-x)$ reflects about y -axis

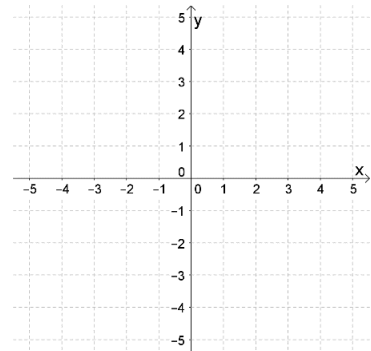
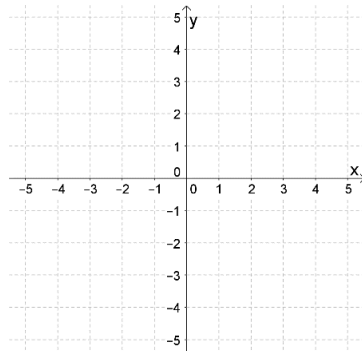
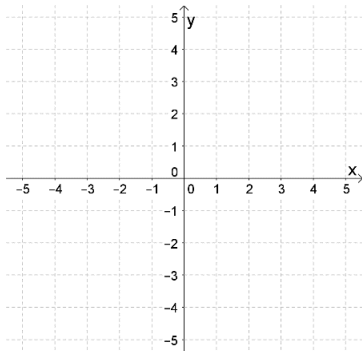
Graphing with transformations

5. Graph each function and find its domain and range.

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

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

$f(x) = -\sqrt{x - 2}$



Domain:

Domain:

Domain:

Range:

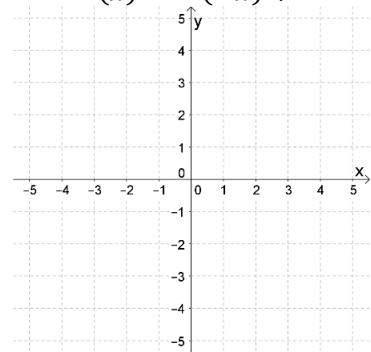
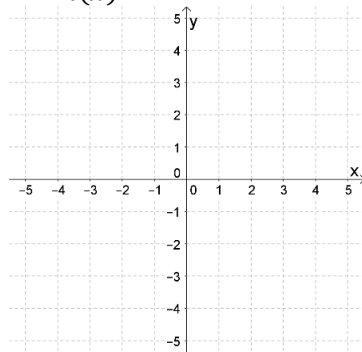
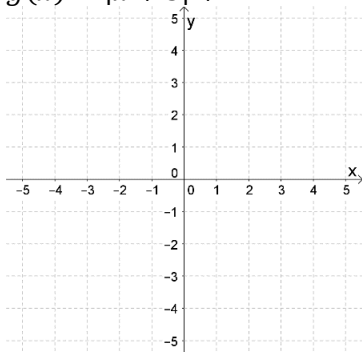
Range:

Range:

$g(x) = |x + 3| + 2$

$n(x) = -2^{x-1}$

$r(x) = \ln(-x) + 1$



Domain:

Domain:

Domain:

Range:

Range:

Range:

6. Match each exponential function to its graph.

(a) 3^x

(b) 2^{-x}

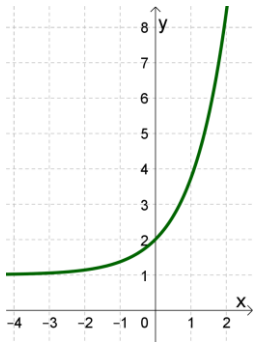
(c) $e^x + 1$

(d) $2^{x+1} - 3$

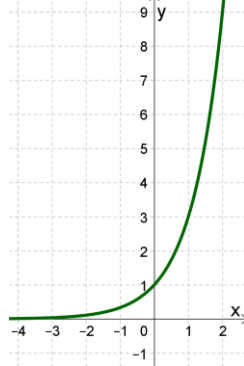
(e) $3^x + 4$

(f) -2^x

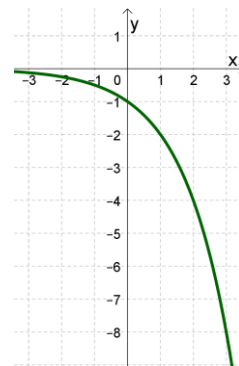
I. _____



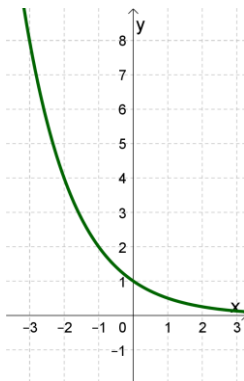
II. _____



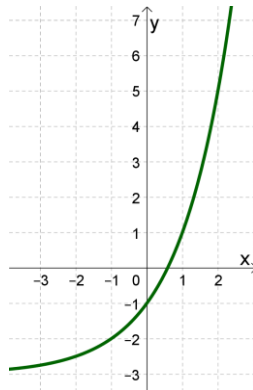
III. _____



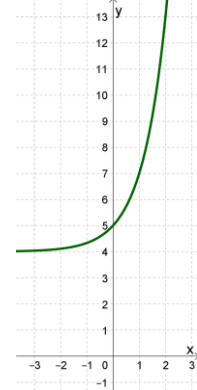
IV. _____



V. _____

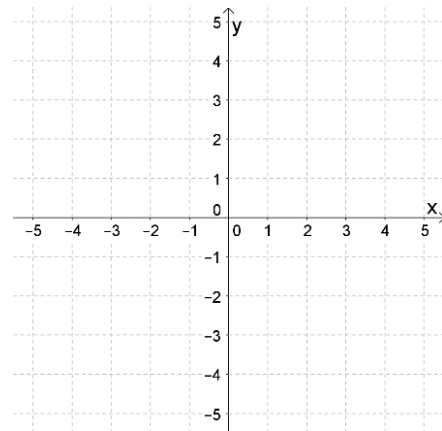


VI. _____



Notes

ex: $f(x) = \begin{cases} x - 2, & x < 1 \\ 2^{x-1}, & x \geq 1 \end{cases}$



Piecewise Functions

7. Given $f(x) = \begin{cases} 5 & \text{if } x \leq -2 \\ 2x - 1 & \text{if } x > -2 \end{cases}$, find:

a) $f(-5)$

b) $f(-3)$

c) $f(-2.001)$

d) $f(-2)$

e) $f(-1.999)$

f) $f(0)$

g) $f(1)$

h) Domain of $f(x)$

8. Find the following function values and then graph each of the following piecewise functions

$$f(x) = \begin{cases} x^2 - 1, & x < 0 \\ \cos x, & x \geq 0 \end{cases}$$

$$g(x) = \begin{cases} 3 - x, & x < 1 \\ 3, & x = 1 \\ \sqrt{x}, & x > 1 \end{cases}$$

$f(-2) =$

$f(0) =$

$g(-1) =$

$g(4) =$

