MAT 1053 - MODULE 1.1 PRE-CLASS WORK myUTSA ID: _____

MODULE 1.1 - FUNCTIONS AND FUNCTION NOTATION

LEARNING OBJECTIVES

In this section, you will:

- Determine whether a relation represents a function.
- Find the value of a function.
- Determine whether a function is one-to-one.
- Use the vertical line test to identify functions.
- Graph the functions listed in the library of functions.

DETERMINING WHETHER A RELATION REPRESENTS A FUNCTION

- State the definition of a function.

- The notation $y = f(x)$ defines a function named f and is read as "y is a function of x". What do the letters x and y represent?
  - x:
  - y:

FINDING INPUT AND OUTPUT VALUES OF A FUNCTION

How To... Given the formula for a function, evaluate.

DETERMINING WHETHER A FUNCTION IS ONE-TO-ONE

- State the definition of a one-to-one function.

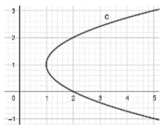
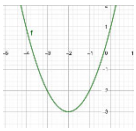
How To... Given a graph of a function, use the horizontal line test determine if the graph represents a one-to-one function.

MODULE 1.1 - CLASS EXAMPLES

Which is a function, and which is not a function?

1. $\{(a,b)\,,\ (c,d),\ (a,c)\}$ $\{(a,b)\,,\ (b,c),\ (c,c)\}$

2. $3x^2 + y = 14$ $2x + y^2 = 6$

3.  

Evaluate the function $g(x) = \frac{x}{12} - \frac{3}{16}$ at the indicated values.

4. $g(-9) =$

5. $-g(9) =$

6. $g(x) = 9$

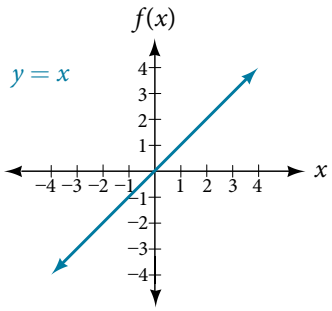
Evaluate the function $(x) = x^2 - 16$ at the indicated values.

7. $f(a+h)$

8. $\frac{f(a+h)-f(a)}{h}$, $h \neq 0$

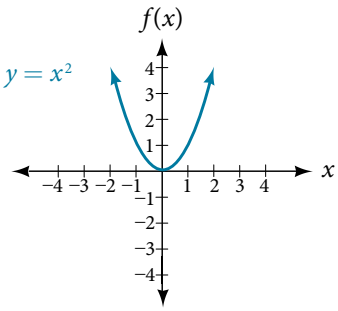
MAT 1053 - Toolkit Functions

Identity



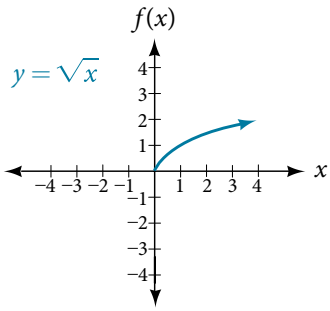
Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$

Square



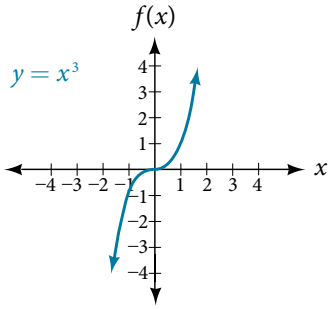
Domain: $(-\infty, \infty)$
Range: $[0, \infty)$

Square Root



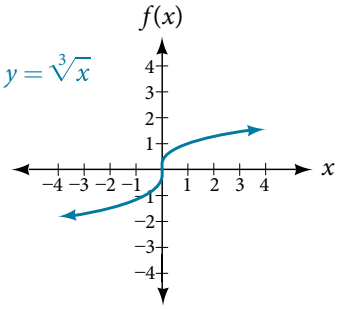
Domain: $[0, \infty)$
Range: $[0, \infty)$

Cubic



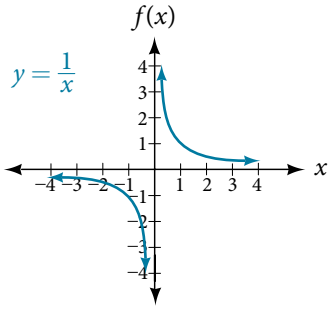
Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$

Cube Root



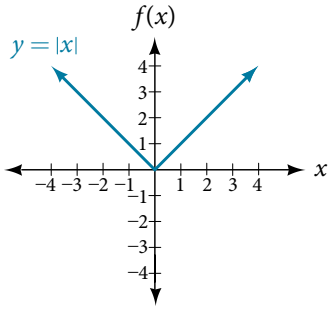
Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$

Reciprocal



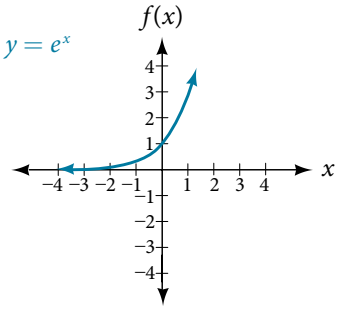
Domain: $(-\infty, 0) \cup (0, \infty)$
Range: $(-\infty, 0) \cup (0, \infty)$

Absolute Value



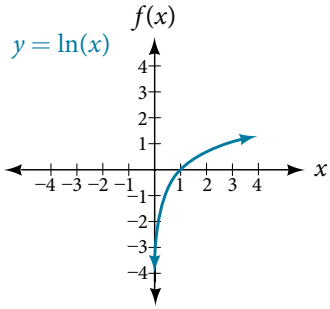
Domain: $(-\infty, \infty)$
Range: $[0, \infty)$

Exponential



Domain: $(-\infty, \infty)$
Range: $(0, \infty)$

Natural Logarithm



Domain: $(0, \infty)$
Range: $(-\infty, \infty)$

Benchmark Formula Sheet
1053/1073

$y = ab^x$	$A(t) = Pe^{rt}$
$A(t) = P\left(1 + \frac{r}{n}\right)^{nt}$	$\det(A) = ad - bc$
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$A = \frac{d\left(\left(1 + \frac{r}{k}\right)^{kt} - 1\right)}{\frac{r}{k}}$
$P = \frac{w\left(1 - \left(1 + \frac{r}{k}\right)^{-kt}\right)}{\left(\frac{r}{k}\right)}$	$h = -\frac{b}{2a}$
$T(t) = Ae^{kt} + T_S$	$A(t) = P(1 + rt)$
$N(t) = \frac{c}{1 + ae^{-bt}}$	$y = A_0e^{kt}$