

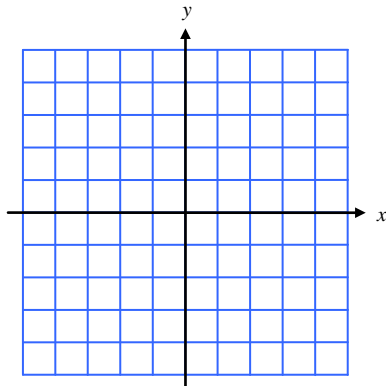
**1.3 TWELVE BASIC FUNCTIONS**

Lesson Targets for 1.3

1. Graph and Identify all 12 parent functions
2. Graph a piecewise function

Parent Function #1: Linear Function (book refers to this as the identity function): Equation: \_\_\_\_\_

Graph this function (label 5 points)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

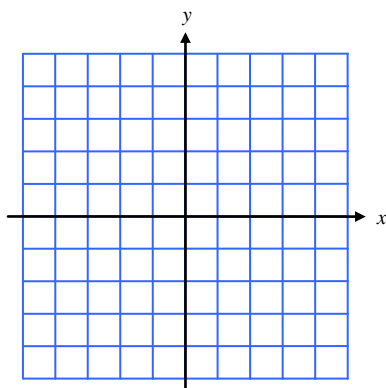
Discontinuities:

Increasing/Decreasing:

Extrema:

Parent Function #2: Quadratic Function (book refers to this as the squaring function): Equation: \_\_\_\_\_

Graph this function (label 5 points)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

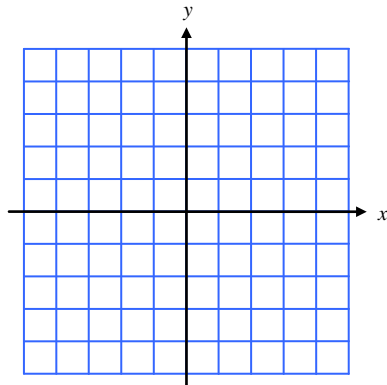
Discontinuities:

Increasing/Decreasing:

Extrema:

Parent Function #3: Cubic Function (the book refers to this as the cubing function) : Equation: \_\_\_\_\_

Graph this function (label 3 points)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

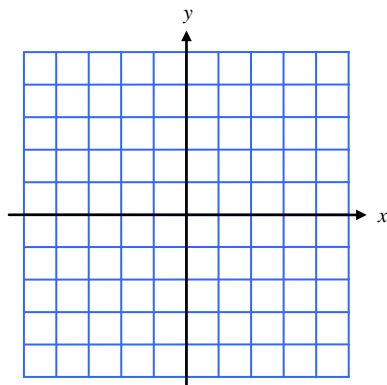
Discontinuities:

Increasing/Decreasing:

Extrema:

Parent Function #4: Inverse Linear Function (book refers to this as the Reciprocal Function): Equation: \_\_\_\_\_

Graph this function  
(label 2 points, a H.A., and a V.A.)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

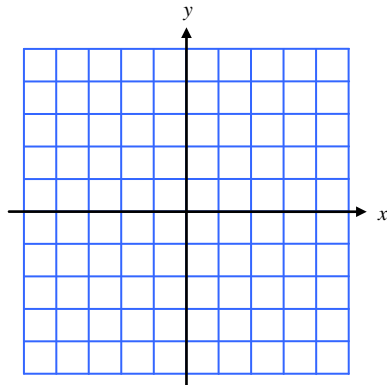
Discontinuities:

Increasing/Decreasing:

Extrema:

Parent Function #5: Square Root Function: Equation: \_\_\_\_\_

Graph this function (label 3 points)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

Discontinuities:

Increasing/Decreasing:

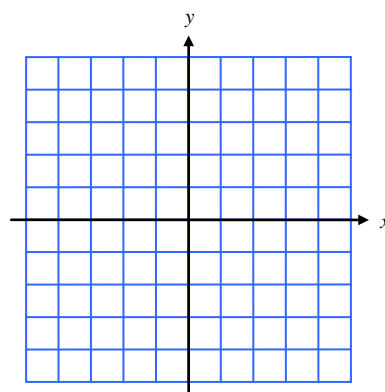
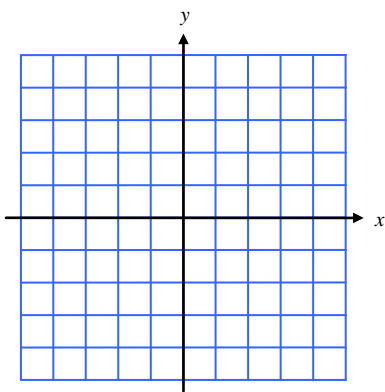
Extrema:

Parent Function #6: Exponential Function: (the book uses only  $f(x) = e^x$ )

I would like you to use the equation  $f(x) = b^x$ ,

where  $b > 1$  represents \_\_\_\_\_, and  $0 < b < 1$  represents \_\_\_\_\_.

Graph each function (label 2 points and a H.A.)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

Discontinuities:

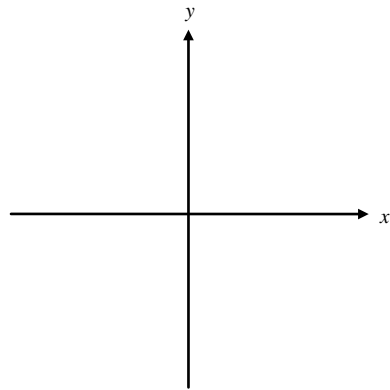
Increasing/Decreasing:

Extrema:

Parent Function #7: Logarithm Function: (the book only uses a natural logarithm)

I would like you to use  $f(x) = \log_b x$

Graph this function (label 2 points and a V.A.)



Symmetry:

Boundedness:

Asymptotes:

Discontinuities:

Increasing/Decreasing:

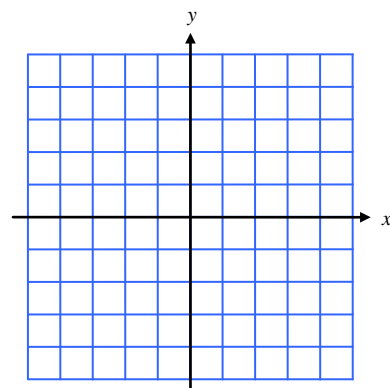
Domain:

Extrema:

Range:

Parent Function #8: Absolute Value Function: Equation: \_\_\_\_\_

Graph this function (label 5 points)



Symmetry:

Boundedness:

Asymptotes:

Discontinuities:

Increasing/Decreasing:

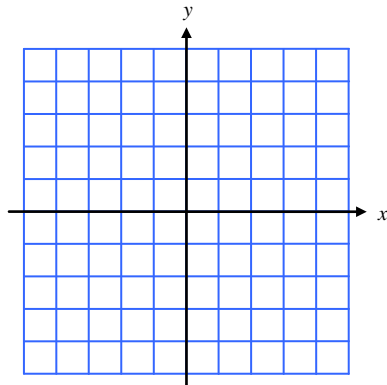
Domain:

Extrema:

Range:

Parent Function #9: Greatest Integer Function: Equation: \_\_\_\_\_

Graph this function (label at least 6 points)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

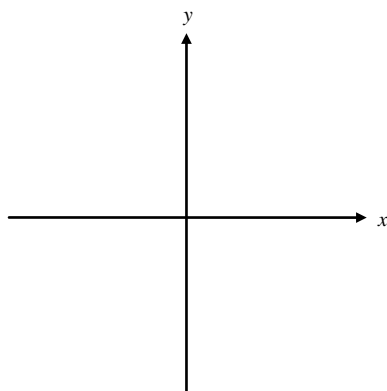
Discontinuities:

Increasing/Decreasing:

Extrema:

Parent Function #10: Logistic Function: Equation: \_\_\_\_\_

Graph this function (label 1 point and 2 H.A.)



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

Discontinuities:

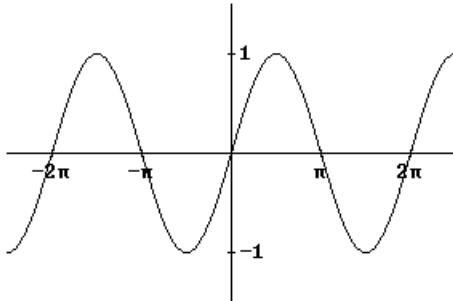
Increasing/Decreasing:

Extrema:

You won't need to graph the next two until 2<sup>nd</sup> Semester ... just be able to tell the difference between the two for now.

Parent Function #11: Sine Function: Equation:  $y = \sin(x)$

Here's a graph of this function



Domain:

Range:

Symmetry:

Boundedness:

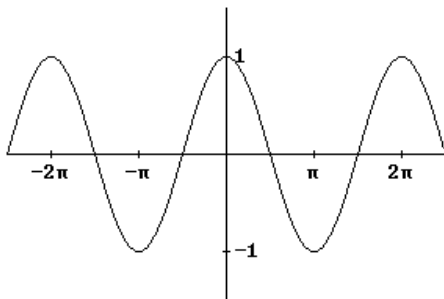
Asymptotes:

Discontinuities:

Extrema:

Parent Function #11: Cosine Function: Equation:  $y = \cos(x)$

Here's a graph of this function



Domain:

Range:

Symmetry:

Boundedness:

Asymptotes:

Discontinuities:

Extrema:

Piecewise Functions

Piecewise Functions are functions that are defined “in pieces”. Each piece is a portion of a graph with a limited domain.

*Example 1:* Graph the following piecewise function:  $f(x) = \begin{cases} 3^x & ; x > 0 \\ |x| & ; x \leq 0 \end{cases}$

