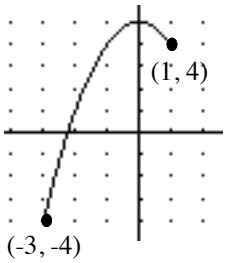
1. Interval Notation
   $(3, 7]$ → All Real Numbers from 3 through 7, Not including 3, but including 7
   This is a half open interval - Open on the left

   $[-2, 9]$ → All Real Numbers from -2 through 9, including -2, and including 9
   This is a closed interval

   $(-10, 0)$ → All Real Numbers from -10 through 0, Not including -10 nor 0
   This is an open interval

2. Find the Domain and Range



   Domain: $[-3, 1]$
   Range: $[-4, 5]$

3. Function Increasing on an Interval
   If for any x_1 and x_2 on the interval, $x_1 < x_2 \rightarrow f(x_1) < f(x_2)$

4. Function Decreasing on an Interval
   If for any x_1 and x_2 on the interval, $x_1 < x_2 \rightarrow f(x_1) > f(x_2)$

5. Constant Function on an Interval
   If for any x_1 and x_2 on the interval, $f(x_1) = f(x_2)$

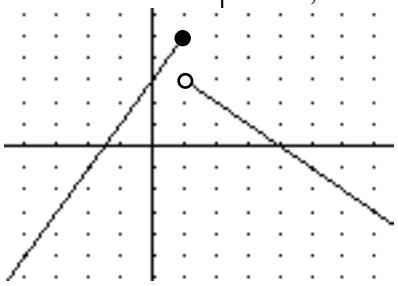
6. f(a) is a Relative Maximum on an Interval (x_1, x_2)
   If $\forall\ x \in (x_1, x_2), f(a) \geq f(x)$

7. f(a) is a Relative Minimum on an Interval (x_1, x_2)
   If $\forall\ x \in (x_1, x_2), f(a) \leq f(x)$

8. $f(x) = [[x]]$ – Greatest Interger Function (Floor Function)
   $[[x]]$ is the Greatest Integer that is not Greater Than x
   $[[3.2]] = 3$ $[[4]] = 4$ $[[5.9]] = 5$ $[[-4.7]] = -5$

9. Piecewise Function

Example: $f(x) = \begin{cases} 2x + 3, & x \leq 1 \\ -x + 4, & x > 1 \end{cases}$



10. f(x) is an Even Function
If $f(x) = f(-x)$ $\forall$ $x \in$ the domain
Even Functions are symmetric about the y-axis

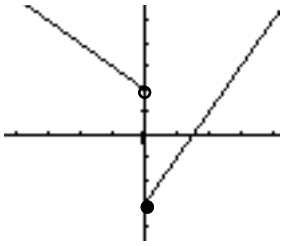
11. f(x) is an Odd Function
If $f(-x) = -f(x)$ $\forall$ $x \in$ the domain
Odd Functions are symmetric about the Origin

12. Assignment 003:
01.03 Graphs of Functions - Page 38, #'s 4, 8, 14a-h, 22, 34, 44, 48, 54

Pre-Calculus 1 Assignment 103
01.03 Graphs of Functions
Page 38, #'s 4, 8, 14a-h, 22, 34, 44, 48, 54

Exer. 1-4: Use the graph of the function to find the domain and range of f. Then find f(0).

4.



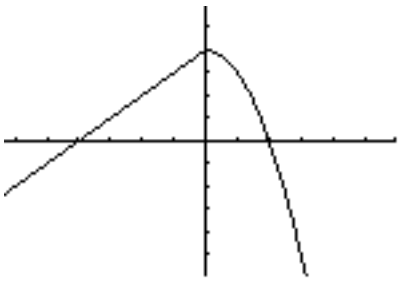
Exer. 5-10: Use a graphing utility to graph the function and estimate its domain and range. Then find the domain and range algebraically.

8. $h(t) = \sqrt{4 - t^2}$

Exer. 11-14: Use the given function to answer the questions.

(a) Determine the domain of the function.
(b) Find the value(s) of x such that f(x) = 0
(c) The values of x from part (b) are referred to as what graphically?
(d) Find f(0), if possible.
(e) The value from part (d) is referred to as what graphically?
(f) What is the value of f at x = 1? What are the coordinates of the point?
(g) What is the value of f at x = -1? What are the coordinates of the point?
(h) The coordinates of the point on the graph of f at which x = -3, can be labeled (-3, f(-3)) or (-3,___)

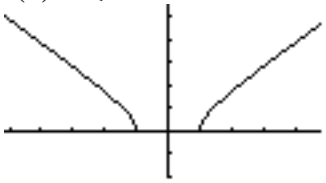
14.



$$f(x) = \begin{cases} x + 4, \text{ if } x \le 0 \\ 4 - x^2, \text{ if } x > 0 \end{cases}$$

Exer. 19-22: Determine the open intervals over which the function is increasing, decreasing, or constant..

22. $f(x) = \sqrt{x^2 - 1}$



Exer. 31-36: Use a graphing utility to approximate any relative minimum or relative maximum values of the function.

34. $y = x^3 - 6x^2 + 15$

Exer. 43-50: Sketch the graph of the piecewise defined function by hand.

44. $f(x) = \begin{cases} x + 6, x \le -4 \\ 2x - 4, \text{if } x > -4 \end{cases}$

48. $f(x) = \begin{cases} x + 5, x \le -3 \\ -2, -3 < x < 1 \\ 5x - 4, x \ge 1 \end{cases}$

Exer. 51-56: Sketch the graph of the function by hand. Then use a graphing utility to verify the graph.

54. $f(x) = [|x - 2|] + 1$