

LESSON PLANS

DATE: 9/27/13

SUBJECT: Pre Calc

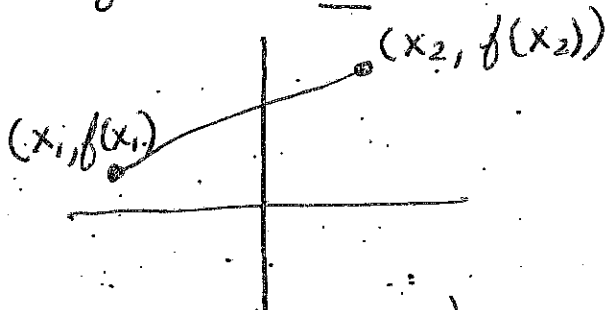
TOPIC: Sec 2-3 Properties of Functions

OBJECTIVES:

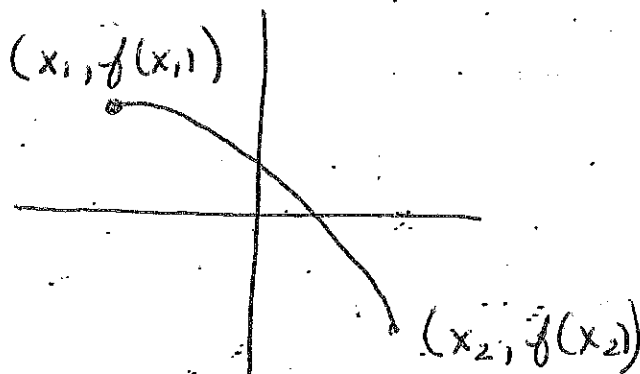
- \* Students are able to use a graph of a function to find when a function is increasing, decreasing, or constant and find local min and local max.
- \* Students are able to determine EVEN + ODD FUNCTIONS from a graph or eq
- \* Students are able to find Average Rate of Change.

PROCEDURE:

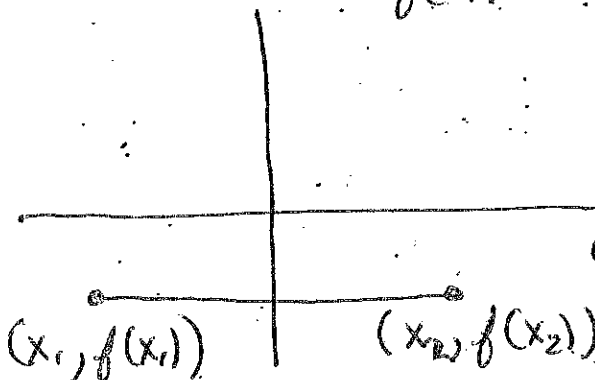
THE BEHAVIOR OF A GRAPH is described in terms of the X VALUES using interval notation



INCREASING ON  
 THE INTERVAL  $(x_1, x_2)$   
 (RISING LEFT TO RIGHT)  
 $f(x_1) < f(x_2)$



DECREASING ON THE  
 Interval  $(x_1, x_2)$   
 (FALLING LEFT TO RIGHT)  
 $f(x_1) > f(x_2)$



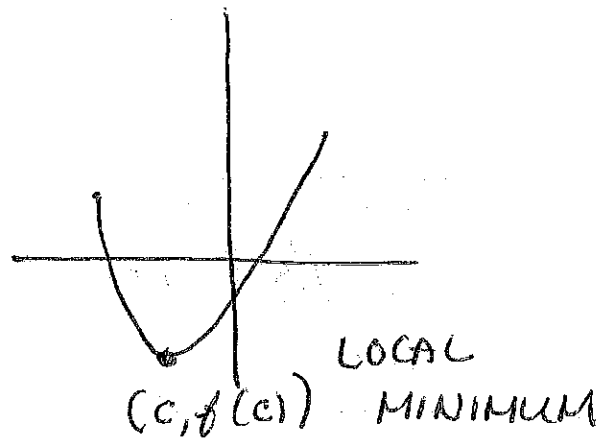
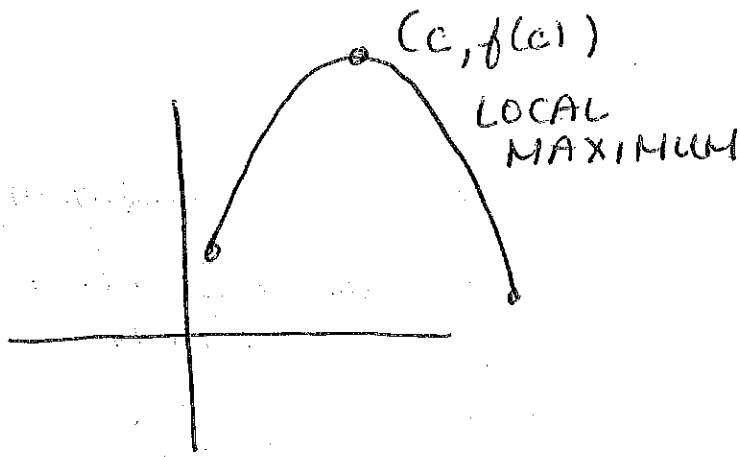
CONSTANT on  
 the interval  $(x_1, x_2)$   
 $(f(x_1) = f(x_2))$

\* TURNING POINTS →  
 LOCAL MINIMUMS  
 OR LOCAL  
 MAXIMUMS

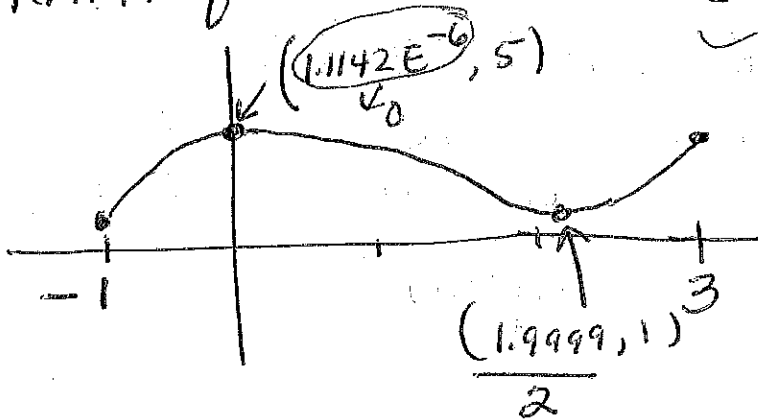
ASSIGNMENT:

p. 88 1-10, 21-31 odd;  
 33-57 by 4's, 63, 65

Graph changes  
 from increasing  
 to decreasing or  
 decreasing to increas.



GRAPH  $f(x) = x^3 - 3x^2 + 5$   $(-1, 3)$



x interval  $\rightarrow$   
 set WINDOW  
 X MIN -1 Y MIN -10  
 X MAX 3 Y MAX 10  
 X SCL 1 Y SCL 1

APPROXIMATE any local max or local min.

Where is the function increasing?

Where is the function decreasing?

(ROUND to 2 dec places where nec.)

LOCAL MIN:  $(2, 1)$

LOCAL MAX  $(0, 5)$

INCREASING from  $(-1, 0)$   $(2, 3)$

DECREASING from  $(0, 2)$

A FUNCTION IS EVEN if for every  $x$  in the domain,  $-x$  is also in the domain. (IF  $(x, y)$  is on the graph,  $(-x, y)$  is on the graph)  $f(-x) = f(x) \rightarrow$  Y AXIS SYMMETRY

A FUNCTION IS ODD if whenever  $(x, y)$  is on the graph,  $(-x, -y)$  is on the graph.  $f(-x) = -f(x) \rightarrow$  SYMMETRIC WITH RESPECT TO ORIGIN.

AVERAGE RATE OF CHANGE OF  $f$  FROM  $c$  TO  $x$  is  $\frac{f(x) - f(c)}{x - c}$  (Difference Quotient in Calc)

EX)  $f(x) = x^3 + 1$  find AVG rate OF change from  $1$  to  $3$ .  $\frac{f(3) - f(1)}{3 - 1} = \frac{28 - 2}{2} = 13$