Honors Algebra II

Notes Section 5.7

Describe and Compare Function Characteristics

Increasing Functions: Rise from LEFT to RIGHT . . . $y = x$ & $y = 2^x$

Decreasing Functions: Fall from LEFT to RIGHT . . . $y = -x$ & $y = 0.5^x$

EXAMPLE 1 Sketch a graph of a(t) where a represents altitude and t represents time for the situation below. Label key information such as local minima and maxima and intervals where a(t) is increasing or decreasing.

A small plane flying at a constant cruising altitude is caught in a storm. Air currents carry the plane up before pushing it down rapidly below its original altitude. The plane exits the storm and returns gradually to its cruising altitude.

Average Rate of Change: finding the slope

$[x_1, x_2]$ is $\dfrac{f(x_2) - f(x_1)}{x_2 - x_1}$

EXAMPLE 2 For the function $f(x) = 2^{x-2} + 1$, find the average rate of change over the intervals [-2,0] , [0,2] , [2,4] , [4,6] and [6,8]. What happens to the average rate of change as x increases? What does this mean for the graph of f(x)?

Interval	Function	Avg. Rate of Change
[-2,0]		
[0,2]		
[2,4]		
[4,6]		
[6,8]		

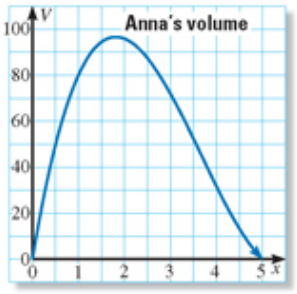
Avg. Rate of Change is _____

Therefore, the graph always _____

Over each interval, _____

_____

EXAMPLE 3 Anna and Zeke cut squares from the corners of rectangular pieces of cardboard and fold up the sides to make open boxes. Anna's cardboard is 10 inches by 12 inches. Zeke's is 8 inches by 15 inches. The volume V as a function of cut -outside length x is shown for Anna at the right and Zeke below.



Zeke's Volume: $V(x) = x(8-2x)(15-2x)$

Compare the maximums and x-intercepts of the functions. Interpret the signifigance of the results.

Zeke's Graph: Maximum _____ & X-intercept: _____

Anna's Graph: Maximum _____ & X-intercept: _____

The pieces have _____

Note: x-intercepts represent the size of the cut-out pieces

The volume of _____

EXAMPLE 4 Fantasy football participants "Draft" players for their teams. Below are models predicting fantasy points for 2 positions as a function of the player's rank. Compare fantasy points as a function of rank for the models.

Tight Ends	Running Backs
(1,175)	(1,400)
(10,90)	(10,200)
(20,60)	(20,140)
(30,45)	(30,110)
(40,35)	(40,85)
(50,25)	(50,65)

Running Back Pts. _____ Tight End Pts.

Running Back Points _____

EXAMPLE 5 Determine whether the function is even, odd or neither.

a) $f(x) = x^3 - 7x$ _____ _____

b) $g(x) = \dfrac{6}{x + 1}$ _____ _____

c) $f(x) = -x^6 + 3x^4 - 2x^2 - 7$ _____ _____