

UNIT 2: What is a Function?

Objectives: Upon completion of the unit, students will be able to:

- Evaluate functions
- Perform algebraic manipulations on functions
- Determine a maximum or minimum of a function to determine intervals of increase and decrease
- Find the domain and range of a function
- Interpret and graph a piece-wise function
- Find and evaluate composite functions
- Determine maximum and minimum in application problems
- Find average rate of change given a function, table of values or a graph
- Evaluate the difference quotient
- Determine transformations from a graph, table or function
- Find and graph the inverse of a function

Video Lectures	Video Examples	Section from Text (WebAssign)
1a. Introduction to Functions (part I and part II) 1b. Find function values (including difference quotient)	1a. Determine function values based on piece-wise graph 1b. Determine domain of a square root function 1c. Determine domain and range of absolute value function 1d. Determine domain of rational function 1e. Determine domain of a function with a square root and denominator	2.1
2a. Graphing cubic functions 2b. Graphing absolute value and square root functions 2c. Interpreting and Graphing Piece-wise functions 2d. Graph Piece-wise function by hand AND on the calculator (he multiplies by the restriction or you can divide by the restriction)	2a. Graph absolute value function using table of values 2b. Graph square root function using table of values 2c. Determine function based on piece-wise graph 2d. Graph a piece-wise function example	2.2
3a. Determine where a function is increasing or decreasing	3a. Projectile max application problem – my video 3b. Volume maximum application problem – my video	2.3
4a. Average rate of change 4b. Average rate of change (3, 3+h)	4a. Average rate of change from a table 4b. Average rate of change from function	2.4
5a. Summary of function transformations (uses a, b, c, d instead of a, b, h, k) 5b. Vertical and horizontal translations 5c. Reflections across x and y-axes 5b. Horizontal and vertical stretches 5d. Even and Odd Functions	5a. Square root function (example function) transformations 5b. Write a function based on given transformations 5c. Graphing using transformations (square root function) 5d. Determine if a function is odd, even or neither	2.5

<p>6a. Algebra of Functions</p> <p>6b. Composite Functions</p> <p>6c. Good example using composite functions</p>	<p>6a. Determine composite function values given graphs (find $f(g(1))$ for example)</p> <p>6b. Find composite function values given functions</p> <p>6c. Find the composite function domain</p>	<p>2.6</p>
<p>7a. Inverse Functions</p> <p>7b. Find the inverse of a rational function</p>	<p>7a. Which graphs are one-to-one?</p> <p>7b. Find an inverse function from a table</p> <p>7c. Force a function to be one-to-one by restricting the domain (parabola example)</p>	<p>2.7</p>