

**Unit 2 – Working with Functions****Basics of Functions & Domains and Ranges (Lesson 2.1)**

- Be able to evaluate a function (i.e  $f(3)$ ) when given multiple representations of the functions: {equation for  $f(x)$ , a graph for  $f(x)$  or a data table/list/mapping for  $f(x)$ }
- Solve a function for a given value of  $f(x)$  (i.e solve  $f(x) = 3$ ) when given multiple representations of the functions: {equation for  $f(x)$ , a graph for  $f(x)$  or a data table/list/mapping for  $f(x)$ }
- State domain and range when given multiple representations of the functions: {equation for  $f(x)$ , a graph for  $f(x)$  or a data table/list/mapping for  $f(x)$ }
- be able to change representations → (i) from graph or data table, write eqn; (ii) from eqn, make graph or data table
- be able to understand the connections amongst the representations (graph, data table, equation/algebraic)

**Features of Functions & New Parent Functions (Lesson 2.2 & Lesson 2.4)**

- Be able to identify key features of any function when presented with a graph of the function. These analysis features would include D/R, asymptotes, optimal points, continuities, symmetry, intervals of increase/decrease
- be able to graph and analyze the key features of the following new parent functions:  
 $\{y = |x|, y = 1/x, y = \sqrt{x}\}$ .

**Inverses of Functions (Lesson 2.3)**

- Be able to write the inverse of functions when presented with graphic and numeric representations of a functions (data tables, lists of ordered pairs)
- Be able to state the domains and ranges of inverse functions when presented with graphic and numeric representations of a functions (data tables, lists of ordered pairs)
- Be able to solve and evaluate (i.e. solve  $f^{-1}(x) = 3$ ) and evaluate ( $f^{-1}(3)$ ) with inverses presented as graphic and numeric representations of a functions (data tables, lists of ordered pairs)
- Be able to work with inverses of linear and quadratic functions when presented with equations and graphs for these functions
- Be able to apply the concept of inverse functions to contextual problems (i.e in physics → the relationship between height vs time and its inverse relationship (of time vs height))

**Transformations of Functions (Lesson 2.5)**

- Be able to perform TRANSLATIONS of the graph of a variety of functions including: {a piecewise defined function & parent functions of  $y = x^2, y = |x|, y = 1/x, y = \sqrt{x}$ }
- Be able to perform VERTICAL STRETCHES/COMPRESSIONS of the graph of a variety of functions including: {a piecewise defined function & parent functions of  $y = x^2, y = |x|, y = 1/x, y = \sqrt{x}$ }
- Be able to state applied transformations of a parent function when presented with an equation or a graph
- Be able to perform transformations upon key points of a function
- Be able to identify the locations of key features of functions after the application of transformations (i.e. new location of vertex, asymptotes, y-intercepts, x-intercepts)