	RED	YELLOW	GREEN

Unit 2&3 – Functions

Basics of Functions

- 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)
- be able to graph and analyze the key features of new parent functions:
  - {$y = |x|$, $y = 1/x$, $y = \sqrt{x}$}

Transformations of Functions

- 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)

Composition of Functions

- Be able to understand the notation used for composition
- Be able to compose two functions when given the equation of both equations
- Be able to compose two functions when presented with multiple representations of the two functions (graphs, tables, equations)
- Be able to evaluate when given compositions (i.e fog(2)) and multiple representations
- Be able to connect the concepts of transformations and compositions when composing functions with/into linear functions (i.e. fog(x) and gof(x) given that $f(x) = mx+b$ and $g(x) = x^2$)

Inverses of Functions • 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 (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 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)			
Unit 2 & 3 – Quadratic Functions **Quadratic Basics:** • Be able to evaluate (f(2) = ?) with all three forms of QF • Be able to analyze all three forms of QF for key features (vertex, roots, y-intercepts, points), from both its equation or its graph • Be able to graph/sketch QF from equations presented in any of the three forms • Be able to apply the features of QF in contextual problems **Quadratic Algebra:** • Be able to solve QE in the form of f(x) = 0 by factorization (when a = 1 and when a > 1) and understand the graphic significance of solutions. • Be able to solve QE in the form of f(x) = 0 using the square root method and the completing the square method, both when a = 1 and a > 1. • Be able to solve QE in the form of f(x) = 0 using the Quadratic Formula. • Be able to solve QE using ANY method when presented with equations in the form of systems (i.e solving f(x) = g(x) where either or both f & g are quadratic functions) • Be able to use the discriminant to predict the number of solutions to the quadratic equation f(x) = 0 • be able to create and solve quadratic equations from word problems • be able to apply knowledge of quadratic functions (features & algebra) to contextual problems when provided with (i) the equation, (ii) the graph, (iii) a data set			
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