Unit 1 – Developing Function Concepts Using Linear Functions

1. Use an algebraic & graphic perspective to review fundamental linear algebra skills & concepts (slope, intercepts, convert) as well as review basic function concepts (notation, evaluate & solve)
2. Generate the graphs of these linear functions on technology (TI-84 & DESMOS)
3. Write linear equations in slope-intercept & point-slope & standard & intercept forms
4. Analyze graphs of linear functions (along with the various forms of the linear equations) to understand the connection between the form of the equation and key features (slope, intercepts) of the graph
5. Work with real world scenarios to write equations that model these scenarios and analyze the scenario as well as apply function basics like domain and range to these scenarios
6. Review algebraic and technology based methods for finding the intersection of two lines and extending these processes to solving systems of equations and thereby extend to **solving inequalities**.
7. Graph and analyze linear functions with domain/range limitations
8. Use linear functions & associated contexts to present the concept of inverting functions and then invert linear functions (and thus eventually, any type of function) algebraically and graphically
9. Use two linear functions (both in context & as a purely algebraic exercise) and compose the two functions
10. Compose a function and its inverse and see what happens and explain the observation(s).
11. Introduce the concept of function transformations using restricted linear functions or piecewise linear functions with translations and dilations
12. Extend linear functions to piecewise functions, step functions and the absolute value function, both in real world contexts and as algebraic expressions

Unit 2 – Applying Function Concepts Using Exponential & Logarithmic Functions

1. Evaluate expressions involving negative, zero & rational exponents
2. Determine (with and without TI-84) roots of common powers (i.e. 5^{th} root of 32 or 7^{th} root of 100)
3. Solve exponential equations in various forms of $y = ab^x$ and solve for any of y,a,or b
4. Solve exponential equations specically for the exponent using graphs or logarithms, both with and without the TI-84 wherein the base can be any number, including the natural base (i.e. solve $5 = 2^{2x+3}$ or $5 = e^{2x}$)
5. Convert exponential equations into logarithmic equations
6. Solve simple logarithmic equations using conversion to exponential form strategy, with & without the TI-84
7. Generate the graphs of exponential and logarithmic functions on technology, both with and without restricted domains (TI-84 & DESMOS)
8. Analyze graphs of exponential functions and identify asymptotes, & intercepts, with and without technology
9. Solve systems of equations and inequalities involving exponential – exponential systems as well as exponential-linear systems
10. Write exponential equations (in multiple variations of $f(x) = ab^x$) from word problems and then be able to solve for f(x), a, b or x (including the use of logs) as well as the appropriate use of the natural base, e, in word problems (i.e. $A(t) = Pe^{rt}$)
11. Use an algebraic & graphic perspective to review basic function concepts (notation, evaluate & solve)
12. Use exponential functions to reinforce the concept of inverting functions and then invert exponential functions algebraically and graphically to introduce the concept of a logarithm
13. Transform the parent functions of $f(x) = 2^x$ and $f(x) = e^x$ & work with the new function of $f(x) = Ae^{k(x-c)} + D$
14. Apply various **reflections** to exponential functions (i.e. $y = -(2^{-x})$ or $y = -(0.5^{-x})$)

Unit 3 - Probability

1. Be able to count outcomes in a probability event/experiment
2. be able to use Venn diagrams, tree diagrams, lists and grids to represent outcomes of combined events
3. be able to calculate probabilities of single and compound events
4. be able to construct tree diagrams to represent outcomes involving sampling with & without replacement, and use these diagrams to calculate probabilities
5. be able to distinguish between mutually exclusive & non-mutually exclusive events
6. be able to solve problems involving conditional probability using tree diagrams, Venn diagrams