Ninth Grade Second Semester Math Curriculum Guide

Third Nine Weeks

Module 3 Linear & Exponential Functions

SSE.B.3 Choose and produce an equivalent form of an *expression* to reveal and explain properties of the quantity represented by the *expression*

CED.A.1 Create *equations* and *inequalities* in one *variable* and use them to solve problems

REI.D.11 Explain why the x-coordinates of the points where the graphs of the *equations* $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$

F-IF.A.1, F-IF.A.2,F-IF.A.3,F-IF.B.4,F-IF.B.5,F-IF.B.6,F-IF.C.7,F-IF.C.9
Functions: Understand that a *function* from one set (called the *domain*) to another set (called the *range*) assigns to each element of the *domain* exactly one element of the *range*
Understand that if f is a *function* and x is an element of its *domain*, then $f(x)$ denotes the output of f corresponding to the input x
Understand that the graph of f is the graph of the equation $y = f(x)$

F-BF.1 Write a *function* that describes a relationship between two quantities*From a context, determine an explicit expression, a recursive process, or steps for calculation

F-BF.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$ and $f(x + k)$ for specific values of k (k, a *constant* both positive and negative)
Find the value of k given the graphs of the transformed *functions*
Experiment with multiple transformations and illustrate an explanation of the effects on the graph with or without technology
F-LE.A.1 Distinguish between situations that can be modeled with *linear functions* and with *exponential functions*

F-LE.A.2 Construct linear and exponential equations, including arithmetic and geometric sequences

F-LE.A.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or any polynomial function

F-LE.B.5 In terms of a context, interpret the parameters (rates of growth or decay, *domain* and *range* restrictions where applicable, etc.) in a *function*

Fourth Nine Weeks

Module 4 & Module 5
Polynomial & Quadratic Expressions/Equations & Functions
A Synthesis of Modeling w/ Equations & Functions

N-RN.B.3 Explain why: The sum/difference or product/quotient (where defined) of two *rational numbers* is *rational* The sum/difference of a *rational number* and an *irrational number* is *irrational*

A-SSE.A.1 Interpret *expressions* that represent a quantity in terms of its context*

A-SSE.A.2 Use the structure of an *expression* to identify ways to rewrite it

A.SSE.B.3 Choose and produce an equivalent form of an *expression* to reveal and explain properties of the quantity represented by the *expression**

Factor a quadratic expression to reveal the *zeros* of the function it defines
Complete the square in a quadratic expression to reveal the *maximum* or *minimum* value of the function it defines

A-APR.A.1 Add, subtract, and multiply *polynomials*
Understand that *polynomials*, like the integers, are closed under addition, subtraction, and multiplication

A-APR.B.3 Identify *zeros* of *polynomials* (linear, quadratic only) when suitable factorizations are available

A-CED.A.1 Create *equations* and *inequalities* in one *variable* and use them to solve problem

A-CED.A.2 Create *equations* in two or more *variables* to represent relationships between quantities

A-CED.A.4 Rearrange *literal equations* using the properties of equality
A-REI.D.11 Explain why the x-coordinates of the points where the graphs of the *equations* $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$