FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Pre-Calculus **Unit Name: Unit 3 Exponential and Logarithmic Functions**

Quality Core Objectives:

Unit 3 Exponential and Logarithmic Functions	
A.1. Prerequisites	a. Solve linear, quadratic, rational, and radical equations
B.1. Mathematical Processes	d. Use the language of mathematics to communicate increasingly complex ideas orally and in writing, using symbols and notations correctly
	e. Make appropriate use of estimation and mental mathematics in computations and to determine the reasonableness of solutions to increasingly complex problems
	f. Make mathematical connections among concepts, across disciplines, and in everyday experiences
	g. Demonstrate the appropriate role of technology (e.g., calculators, software programs) in mathematics (e.g., organize data, develop concepts, explore relationships, decrease time spent on computations after a skill has been established)
F.2. Exponential and Logarithmic Functions	a. Use properties of exponents to simplify and evaluate expressions involving real exponents
	b. Use properties of logarithms to simplify and evaluate expressions involving logarithms
	c. Solve equations involving real exponents
	d. Solve equations with variable exponents by using logarithms
	e. Use the natural base *e* to evaluate exponential expressions, solve exponential equations, and graph exponential functions
	f. Solve exponential and logarithmic equations and real-world problems involving exponential and logarithmic equations (e.g., compound interest, exponential growth and decay)

Purpose of the Unit: **Develop an understanding between the exponential function and its inverse, the logarithmic function. Analyze and graph exponential and logarithmic functions. Solve exponential and logarithmic equations.**

Prerequisites: **Laws of exponents**

Daily Lesson Guide

Day	Lesson Content and Objectives	Focus Questions	Critical Thinking (High Yield / Literacy /LTF/etc.)	Engagement	Assessment and/or Accommodations
1	Examine exponential growth and decay	What is exponential growth and decay?		Skittles activity on growth and decay	Use graphing calculator to find the exponential regression equation
2	Examine exponential growth and decay	What is exponential growth and decay?		Skittles activity on growth and decay	Analyze the equation y=a(b)^x Pg 280 21-28
3	Graph using transformations Find the value of e	How do we transform an exponential graph?		Use parent charades to graph exponential transformations Find $\lim(1+1/x)^x$	Pg 280 29-36 all, 37-55 odds

4	**Composition of Functions**	**If this is a composite figure, What is a composite function?**	**LTF – Composition Exploration**		**LTF – Composition of Functions exploration**
5	**Inverse Functions**	**How do we find an inverse function?**	**Show one, do one**		**Pg 267 47, 50, 53, 56, 59, 62, 65, 68**
6	**Log form to Exponential Form**	**How do we find the inverse of an exponential function?**	**Math Notes**		**Pg 294 9-37 odds**
7	**Graphs of Logs**	**Compare the exponential graph to a log graph. Transforming a log graph**	**Math Notes**	**Compare and Contrast the exponential and log graphs**	**Pg 294 37-47 odds, 63-70 all**
8	**Review Concepts**				**Pg 344-345 7, 11, 15, 17, 29, 53, 55**

9	**Assessment**				**Assessment of Exponential Graphs, Inverse functions, Composition of functions, Log graphs**
10	**Solving Exponential and Log Equations**	**How can solve if the bases are the same?**		**Show DVD in back of book.**	**Pg 295 57-79 odds, 87 – 109 odds**
11	**Write logs using sum/difference**	**How are logs like the laws of exponents?**		**Rewrite logs using sum/difference.**	**Pg 305 31-63 odds**
12	**Solve log equations**	**What strategies should we use to solve the different problems.**	**Categorize problems and develop strategies.**	**Discuss and develop strategies needed to solve exponential and log equations.**	**Pg. 311 5-31 odds**
13	**Solving log equations**			**Use classroom voting with clickers to solve equations**	**Pg 311 33-59 odds**

14	**Review**		**Ghosts in the Graveyard game**		
15	**Assessment**				**Assessment Solving log equations** *** Application problems removed**