Unit 05: Exponential Functions & Logs

Content Area: **Mathematics**
Course(s): **PreCalc Trig H**
Time Period: **Semester 1**
Length: **3 weeks**
Status: **Published**

Standards - NJCCS/CCSS

CCSS.Math.Content.HSF-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
CCSS.Math.Content.HSF-IF.C.7.e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
CCSS.Math.Content.HSF-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
CCSS.Math.Content.HSF-IF.C.8.a	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
CCSS.Math.Content.HSF-IF.C.8.b	Use the properties of exponents to interpret expressions for exponential functions.
CCSS.Math.Content.HSF-LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
CCSS.Math.Content.HSF-LE.A.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
CCSS.Math.Content.HSF-LE.A.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.
CCSS.Math.Content.HSF-LE.B	Interpret expressions for functions in terms of the situation they model
CCSS.Math.Content.HSF-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.

Enduring Understandings

Exponetial and logarithmic functions can be used to model real life data.

Graphs of exponential and logarithmic functions follow the same translation rules as other functions studied.

Essential Questions

What does the graph of a logarithmic equation look like?

What does the graph of an exponential equation look like?

How do you simplify and expand logarithmic expressions?

How do you solve logarithmic equations?

How can exponential and logarithmic equations be used to solve applied problems?

Knowledge and Skills

SWBAT know the properties and graphs of $y = a^x$ and $y = e^x$.

SWBAT apply exponential functions.

SWBAT define and know the properties of logarithmic functions.

SWBAT graph logarithmic functions.

SWBAT solve exponential and logarithmic equations.

Resources

Precalculus with Limits

Authors: Aufmann, Barker, Nation

Graphing Calculator

www.desmos.com

www.flipgrid.com

www.graphfree.com