Accelerated Pre-Calculus
May 2023 Calendar
Units 10 - Logarithms

Monday	Tuesday	Wednesday	Thursday	Friday
				4/28 Unit 10.01 (Day 1) Exponential Function Review Math EOC (Algebra) 8:20-11:45am
5/1 10.01 Exponential Function Review (Day 2) Solving Equations with like bases	5/2 10.02 Log Functions Converting between log form and exponential form • Special log bases Evaluate logs	5/3 10.03 Properties of Logs • Expanding Logs • Condensing Logs	5/4 10.03 Properties of Logs (Day 2)	5/5 10.04 Solving Equations (Lesson 3-4) Exponential Equations
8 10.05 Solving Log Equations (Lesson 3-4) • Log Equations	9 10.06 Solving Log and exponential Equations- Lumberjack Logs Activity	10 10.07 Review Logs- Solving Equations and Properties	11 10.07 Review (day 2) Logs- Solving Equations and Properties	12 10.08 Graphing Log Functions
15 10.09 Graphing Log Functions (Day 2)	16 10.10 Log Test Review (Day 1)	17 10.10 Log Test Review (Day 2)	18 10.10 Log Test Review (Day 3)	19 **10.11 Log Test**
22 Makeups and Recoveries	23 Makeups and Recoveries (Periods 1,2,3) *Half-Day 8:20am -12:40pm	24 Makeups and Recoveries (Periods 4,5,6) *Half-Day 8:20am -12:40pm	25 **Last Day of School** Makeups and Recoveries (Period 7) *Half-Day 8:20am -12:40pm	26 Teacher Post-Planning Day

Logarithms: $\log_b x = y$ if and only if $b^y = x$

The **logarithm** of a positive number is the **power** of the ***base*** that produces that number.

$\log N$: A logarithm whose ***base*** is 10 is called a ***common logarithm***.

$\ln N$: A logarithm whose ***base*** is *e* is called a ***natural logarithm***.

Properties of Logarithms:

(1) Argument = 1: $\log_b 1 = 0$ or $\log 1 = 0$ or $\ln 1 = 0$

(2) Argument = Base: $\log_b b = 1$ or $\log 10 = 1$ or $\ln e = 1$

(3) Argument = Power of Base: $\log_b b^x = x$ or $\log 10^x = x$ or $\ln e^x = x$

(4) Exponent = Logarithm: $b^{\log_b x} = x$ or $10^{\log x} = x$ or $e^{\ln x} = x$

(5) Product Property: $\log_b xy = \log_b x + \log_b y$

(6) Quotient Property: $\log_b \frac{x}{y} = \log_b x - \log_b y$

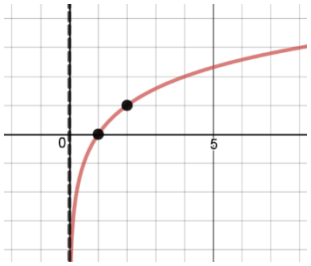
(7) Power Property: $\log_b x^m = m \log_b x$

(8) One-to-One Property: $\log_b x = \log_b y$ if and only if $x = y$

(9) Change of Base Property: $\log_b x = \frac{\log_a x}{\log_a b} = \frac{\log x}{\log b} = \frac{\ln x}{\ln b}$

Graph of Logarithmic Function:

Parent Graph of $f(x) = \log_2 x$



Function Transformation for $g(x) = a \log_n(bx - h) + k$

- a is the vertical stretch (if |a| > 1) or compression (if 0 < |a| < 1)
- a is the reflection over the x-axis (if a < 0)
- b is the reflection over the y-axis (if b < 0)
- h is the horizontal shift (left if h < 0 and right if h > 0)
- k is the vertical shift (up if k > 0 and down if k < 0)

(1) Graph the Asymptote: $x = h$, unless reflected over the y-axis then $x = -h$.

(2) Find where the parent's x-intercept moved to by following the transformations.

(3) Find where the additional point of $(base, 1)$ moved to by following the transformations.

(4) Draw a smooth curve approaching the asymptote.

Domain: (h, ∞), unless reflected over the y-axis then $(-\infty, -h)$

Range: $(-\infty, \infty)$

For the *new x-intercept*: set $g(x) = 0$ and solve for x.