

BOARD NOTES

17 OCTOBER 2019

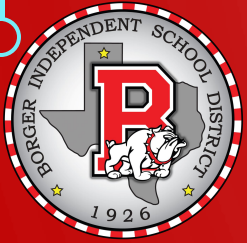


2A.2 (B) graph and write the inverse of a function using notation such as $f^{-1}(x)$;

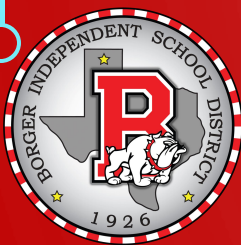
2A.2 (C) describe and analyze the relationship between a function and its inverse (quadratic and square root, logarithmic and exponential), including the restriction(s) on domain, which will restrict its range;

2A.2 (D) use the composition of two functions, including the necessary restrictions on the domain, to determine if the functions are inverses of each other.

2A.5 (C) rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations;



We will be able to rewrite exponential equations as their corresponding logarithmic equations and logarithmic equations as their corresponding exponential equations.



WHAT WE NEED:

- TI – 84
- VLT
- HLT

I WILL BE ABLE TO COMPLETE MY HOMEWORK GIVEN THE

- Equation

The **exponential function f with base b** is defined by

$$f(x) = b^x \quad \text{or} \quad y = b^x,$$

where b is a positive constant other than 1 ($b > 0$ and $b \neq 1$) and x is any real number.

For $x > 0$ and $b > 0, b \neq 1$,

$$y = \log_b x \text{ is equivalent to } b^y = x.$$

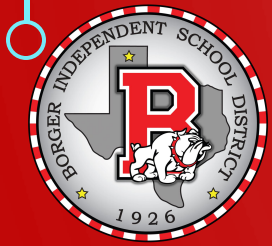
The function $f(x) = \log_b x$ is the **logarithmic function with base b** .

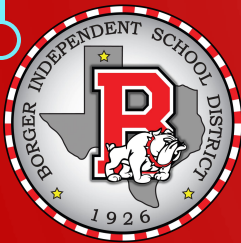


The equation of the inverse of an exponential function can be written as the logarithmic function of the same base.

Conversely, the inverse of a logarithmic function is the exponential function of the same base.

They are inverses of each other.





$$2^{-2} = \frac{1}{4}$$

$$2^{-1} = \frac{1}{2}$$

$$2^0 = 1$$

$$2^2 = 4$$

$$2^3 = 8$$

$$2^4 = 16$$

$$2^5 = 32$$

$$2^x = N$$

$$\equiv \log_2 8 = 3$$

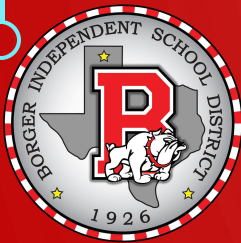
$$7^{-1} = \frac{1}{7}$$

$$7^0 = 1$$

$$7^1 = 7$$

$$7^2 = 49$$

$$7^3 = 343$$



$$\log_3 81 = 4 \equiv 3^4 = 81$$

$$\log_4 4 = 1 \equiv 4^1 = 4$$

$$8^2 = 64 \equiv \log_{64} 64 = 2$$

$$5^0 = 1 \equiv \log_5 1 = 0$$

$$\log_5 25 = y$$

$$\equiv 5^y = 25$$

$$5^y = 5^2$$

$$y = 2$$

$$\boxed{\log_5 25 = 2}$$

$$\log_4 16 = y$$

$$\equiv 4^y = 16$$

$$4^y = 4^2$$

$$\boxed{\log_4 16 = 2}$$

$$\log_4 (-16) = y$$

$$\equiv 4^y = -16 \leftarrow$$

$$D: (0, \infty) \leftarrow$$

$$R: \mathbb{R}$$

$$D: \mathbb{R}$$

$$R: (0, \infty) \leftarrow$$

DNE



$$\begin{aligned}3^0 &= 1 \\3^1 &= 3 \\3^2 &= 9\end{aligned}$$

$$\begin{aligned}\log_{10} 3 &= \boxed{3} \\ \equiv 10^y &= 10^3\end{aligned}$$

$$\begin{aligned}\log_9 3 &= \frac{1}{2} \\ \equiv 9^y &= 3^1 \\ 3^{2 \cdot y} &= 3^1 \\ 2y &= 1 \\ y &= \frac{1}{2}\end{aligned}$$

$$\begin{aligned}\log_3 \frac{1}{3} &= \boxed{-1} \\ \equiv 3^y &= \frac{1}{3} \\ 3^y &= 3^{-1}\end{aligned}$$

$$\begin{aligned}\log_{16} \frac{1}{2} &= \\ \equiv 16^y &= \frac{1}{2} \\ 16^y &= 2^{-1} \\ 2^{4y} &= 2^{-1}\end{aligned}$$