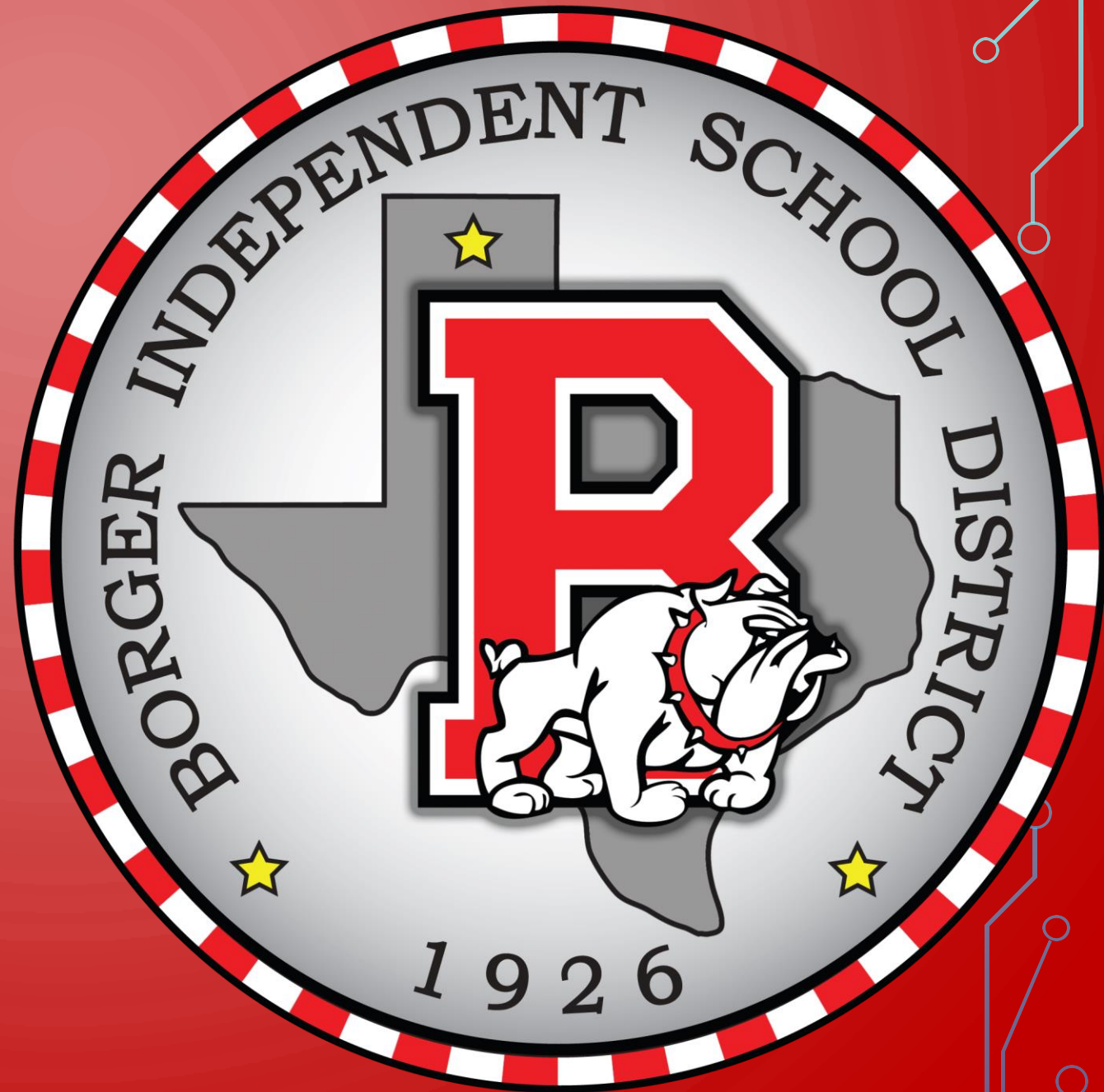


# BOARD NOTES

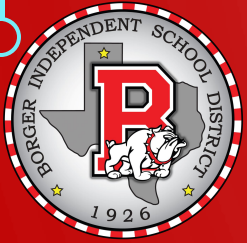
15 OCTOBER 2019



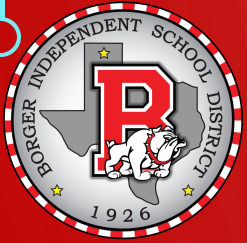
2A.2 (B) graph and write the inverse of a function using notation such as  $f^{-1}(x)$ ;

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.



We will be able to determine the inverse of an equation without graphing.



WHAT WE NEED:

- TI – 84
- VLT
- HLT

I WILL BE ABLE TO COMPLETE MY HOMEWORK GIVEN THE

- Equation
  - Change  $f(x)$  to  $y$
  - Swap  $x$  and  $y$
  - Solve for  $y$

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

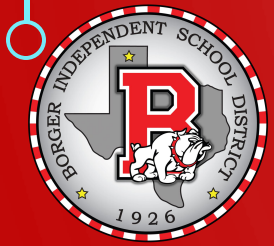
$$f(x) = b^x \quad \text{or} \quad y = b^x,$$

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  $b > 0, b \neq 1$ ,

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

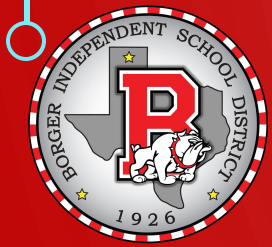
The function  $f(x) = \log_b x$  is the **logarithmic function with base  $b$** .



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.







$$f(x) = 2^x$$

| x | y |
|---|---|
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |

$$D: \mathbb{R}$$

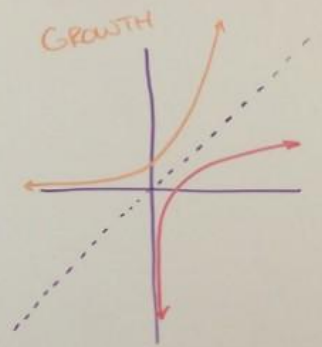
$$R: (0, \infty)$$

$$f^{-1}(x) = \log_2 x$$

| x | y |
|---|---|
| 1 | 0 |
| 2 | 1 |
| 4 | 2 |

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

$$R: \mathbb{R}$$



$$f(x) = \log_3 x \quad f^{-1}(x) = 3^x$$

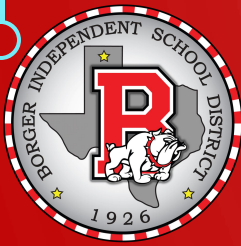
$$y = \log_3 x$$

$$x = \log_3 y$$

↑ EXPONENT  
↑ BASE

$$3^x = y$$

WHAT IT EQUALS



$$f(x) = b^x$$
$$y = b^x$$
$$x = b^y$$

$$f(x) = 5^x$$
$$y = 5^x$$
$$x = 5^y$$

$$f^{-1}(x) = \log_5 x$$

By DEFN OF  
LOG  
 $y = \log_5 x$

| x | y   |
|---|-----|
| 1 | 0   |
| 2 | 25  |
| 3 | 125 |

| x   | y |
|-----|---|
| 0   | 1 |
| 25  | 2 |
| 125 | 3 |

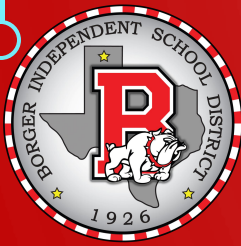
Global Thinker - Students will have basic knowledge of politics, world issues, foreign affairs, and geography. They will be aware of current events and be able to analyze and make informed decisions on issues affecting the national and international world.

Skill Builder with Entrepreneurial Spirit - Students will be able to think critically, analyze situations, gain insight, and take calculated risks to achieve goals and objectives. They will be able to manage the marketplace to find business opportunities and have the confidence to start and run businesses.

Proficient Technology User - Students will use technology as a tool to research, identify, and complete goals and objectives. They will demonstrate knowledge of computers, internet, software applications, and the effective use of technology.

Contributing Citizen - Students will understand energy, time, and learn to respect the wishes of themselves and others. They will display a sense of social responsibility, demonstrate citizenship. They will accept personal and societal, choose ethical behavior, and take personal responsibility for their actions.

1.1 (A) apply mathematical problems in everyday society, and workp



$$f(x) = \frac{1}{2}x$$

$$y = \frac{1}{2}x$$

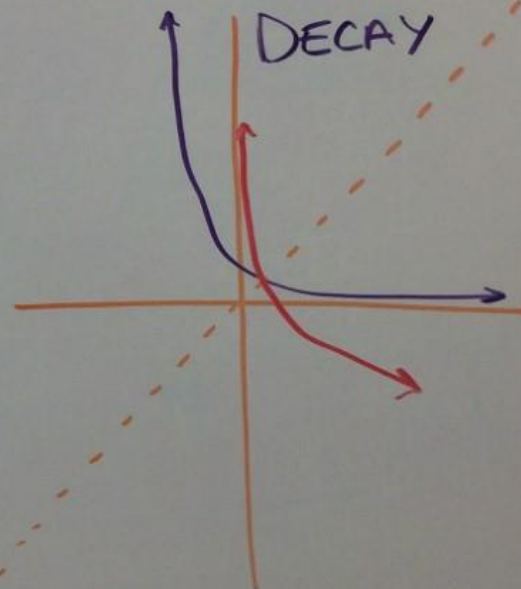
$$x = \frac{1}{2}y$$

$$y = \log_{\frac{1}{2}} x$$

$$D: \mathbb{R}$$

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

$$f^{-1}(x) = \log_{\frac{1}{2}} x$$



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

$$R: \mathbb{R}$$





$$1) f^{-1}(x) = \log_2 x$$

$$5) f^{-1}(x) = 5^x$$