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 $b > 0$, $b \neq 1$,

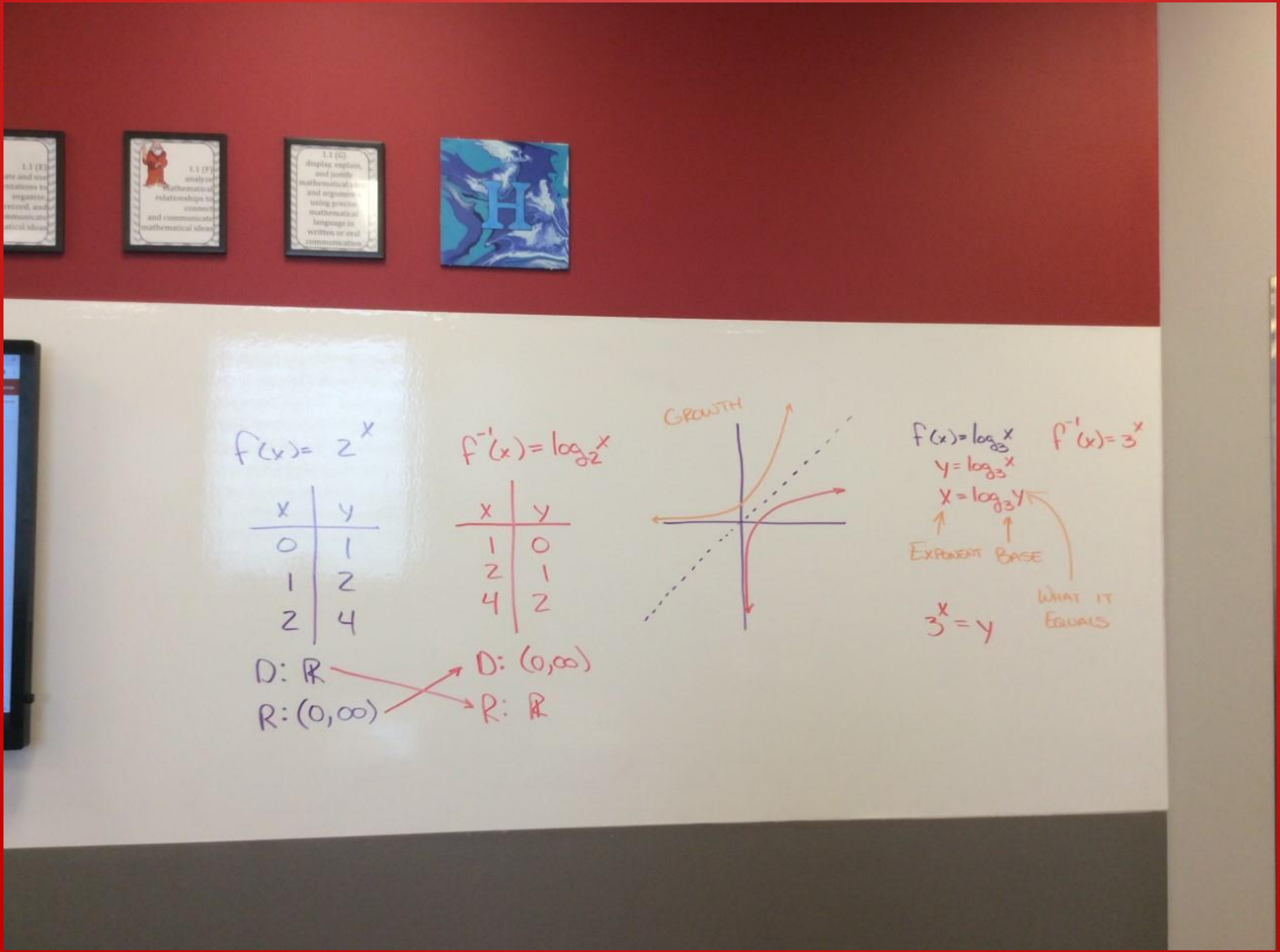
$$y = \log_b x \text{ is equivalent to } b^y = x.$$

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

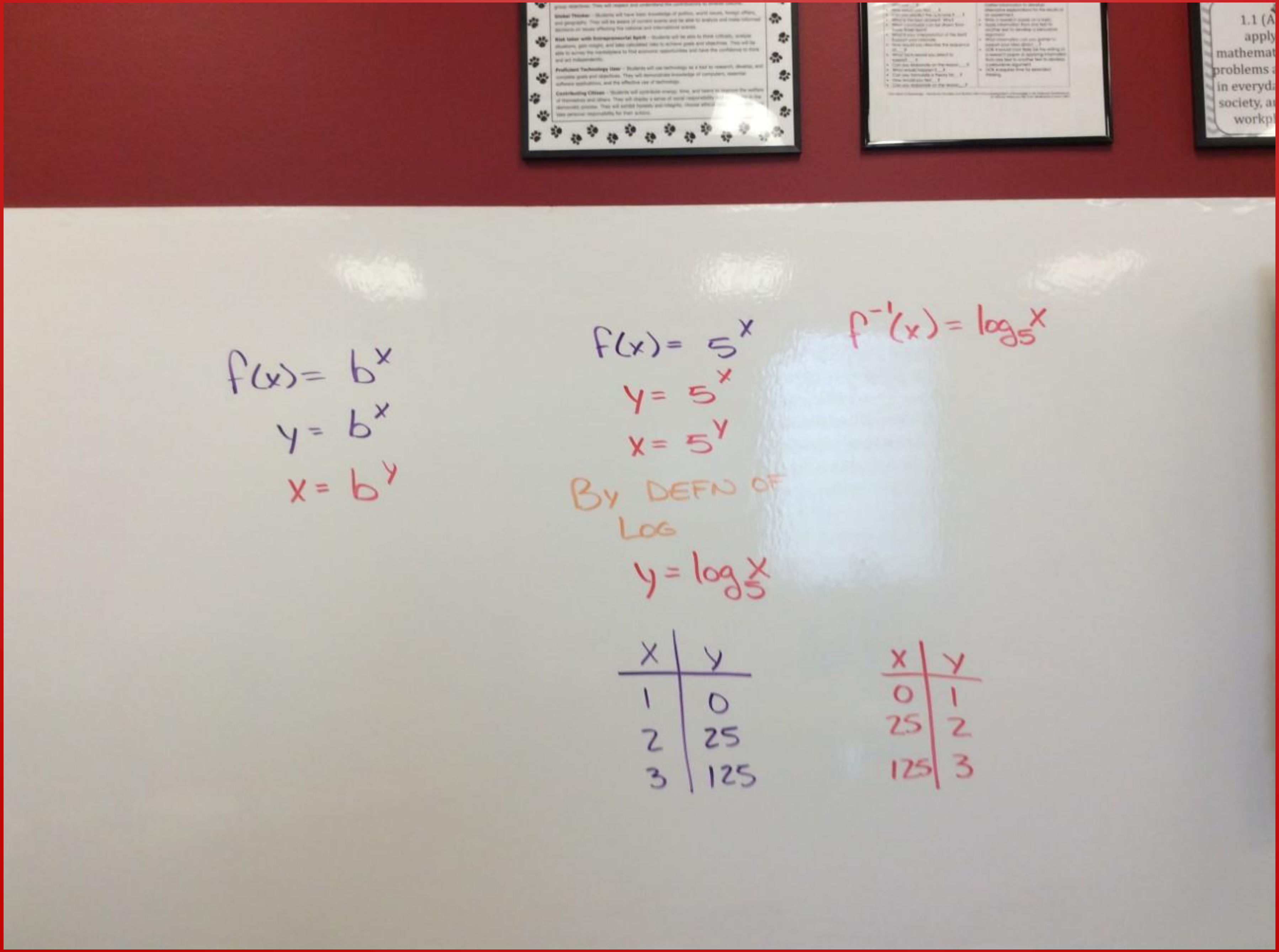
The equation of the inverse of an exponential function can be written as the logarithmic function of the same base.

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

They are inverses of each other.



H
$f(x) = 2^x$
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: $\mathbb{R}$
GROWTH
$f(x) = \log_3 x$
$f^{-1}(x) = 3^x$
$y = \log_3 x$
$x = \log_3 y$
EXPONENT
BASE
WHAT IT EQUALS
$3^x = y$


f(x) = b^x
y = b^x
x = b^y
f(x) = 5^x
y = 5^x
x = 5^y
By DEFN OF
LOG
y = log_5 X
f^-1(x) = log_5 X
x | y
1 | 0
2 | 25
3 | 125
x | y
0 | 1
25 | 2
125 | 3

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

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

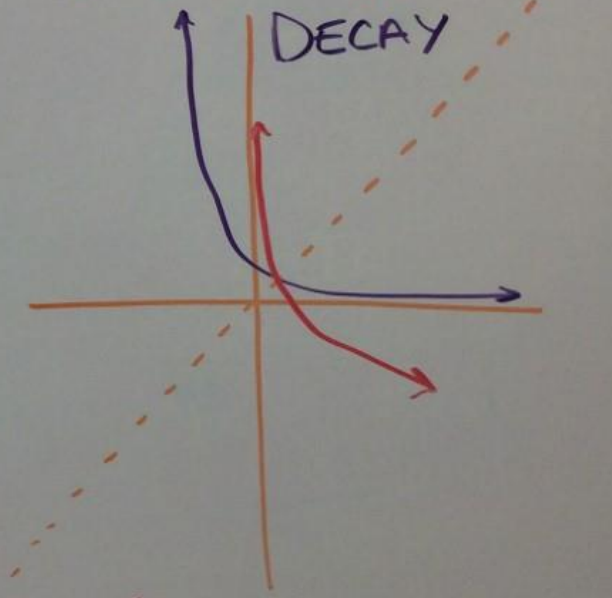
$x = \frac{1}{2}^{y}$

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

D: $\mathbb{R}$

R: $(0, \infty)$

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



D: $(0, \infty)$

R: $\mathbb{R}$

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

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