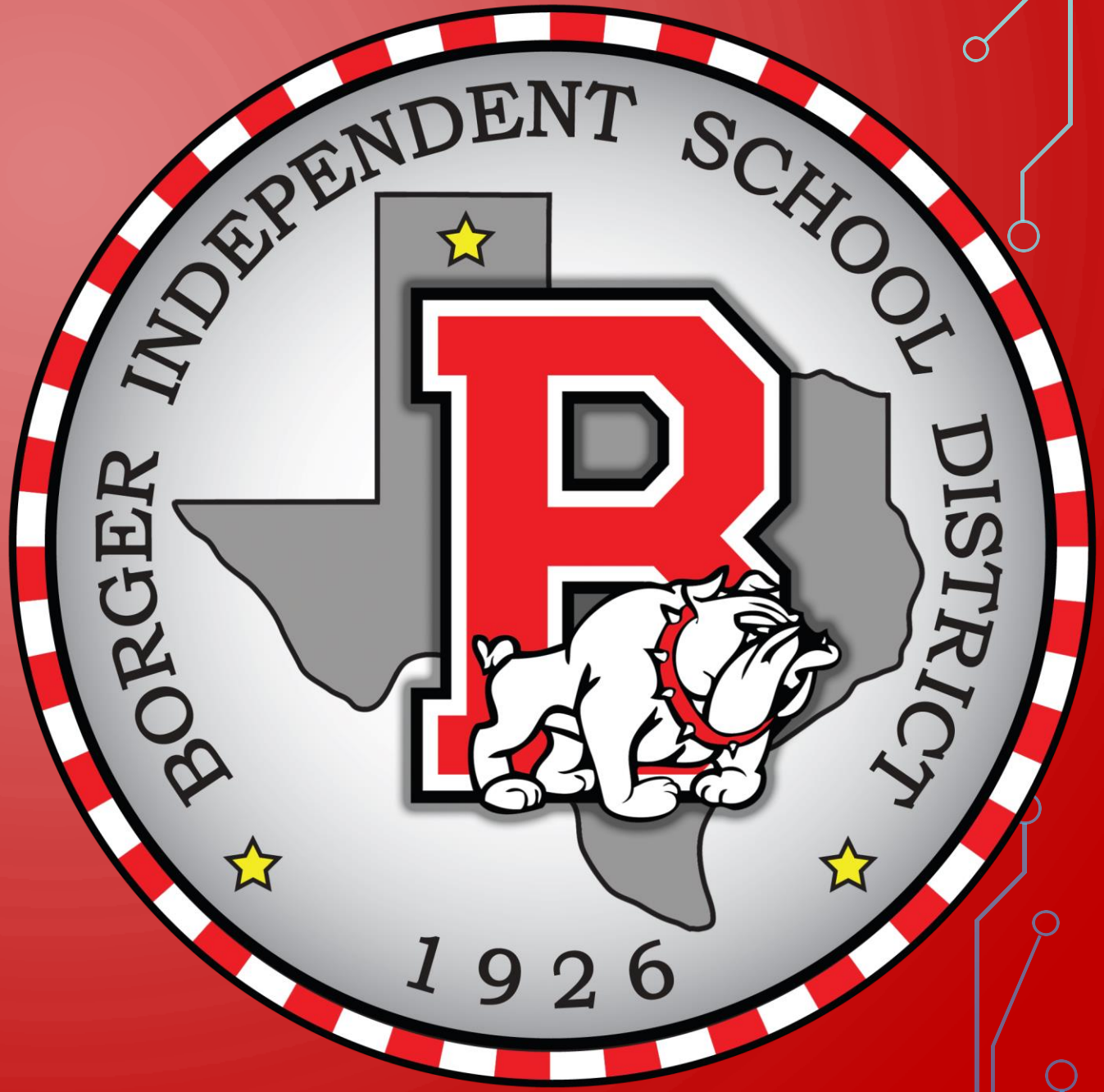
BOARD NOTES

26 FEBRUARY 2020



2A.5 (B) formulate exponential and logarithmic equations that model real-world situations, including exponential relationships written in recursive notation;

2A.5 (D) solve exponential equations of the form $y = ab^x$ where a is a nonzero real number and b is greater than zero and not equal to one and single logarithmic equations having real solutions;

2A.5 (E) determine the reasonableness of a solution to a logarithmic equation.

We will be able to solve exponential and logarithmic equations by using various methods.

WHAT WE NEED:

- TI-84
- Laws of Exponents
- Definition of Exponential
- Definition of Logarithmic

I WILL BE ABLE TO COMPLETE MY HOMEWORK GIVEN THE

- Equation

Laws of Exponentials

$$a^m a^n = a^{m+n}$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$a^{-m} = \frac{1}{a^m}$$

If $a^m = a^n$ then $m = n$

Laws of Logarithms

$y = \log_b x$ if and only if $b^y = x$
$y = \log x$ if and only if $10^y = x$
$y = \ln x$ if and only if $e^y = x$

$$\log_b MN = \log_b M + \log_b N$$

$$\log_b \frac{M}{N} = \log_b M - \log_b N$$

$$\log_b M^k = k \log_b M$$

If $\log_b M = \log_b N$ then $M = N$

$$2\log_8 x - \log_8 4 = \log_8 2 + \log_8 8$$

1) $\log_3 x^2 - \log_3 4 = \log_3 2 + \log_3 8$

Power

$\log_3 \frac{x^2}{4} = \log_3 16$

Quotient

Product

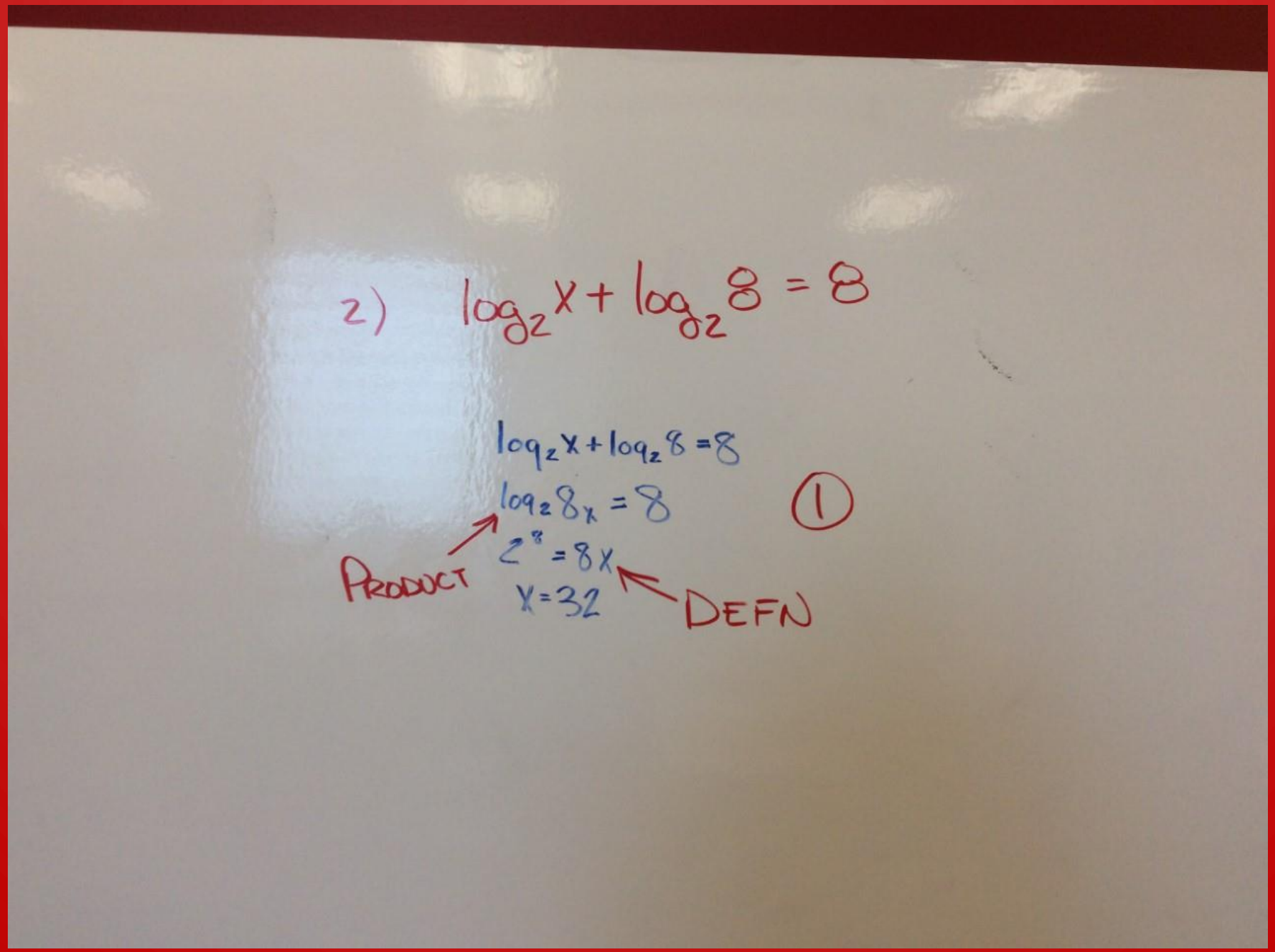
(2)

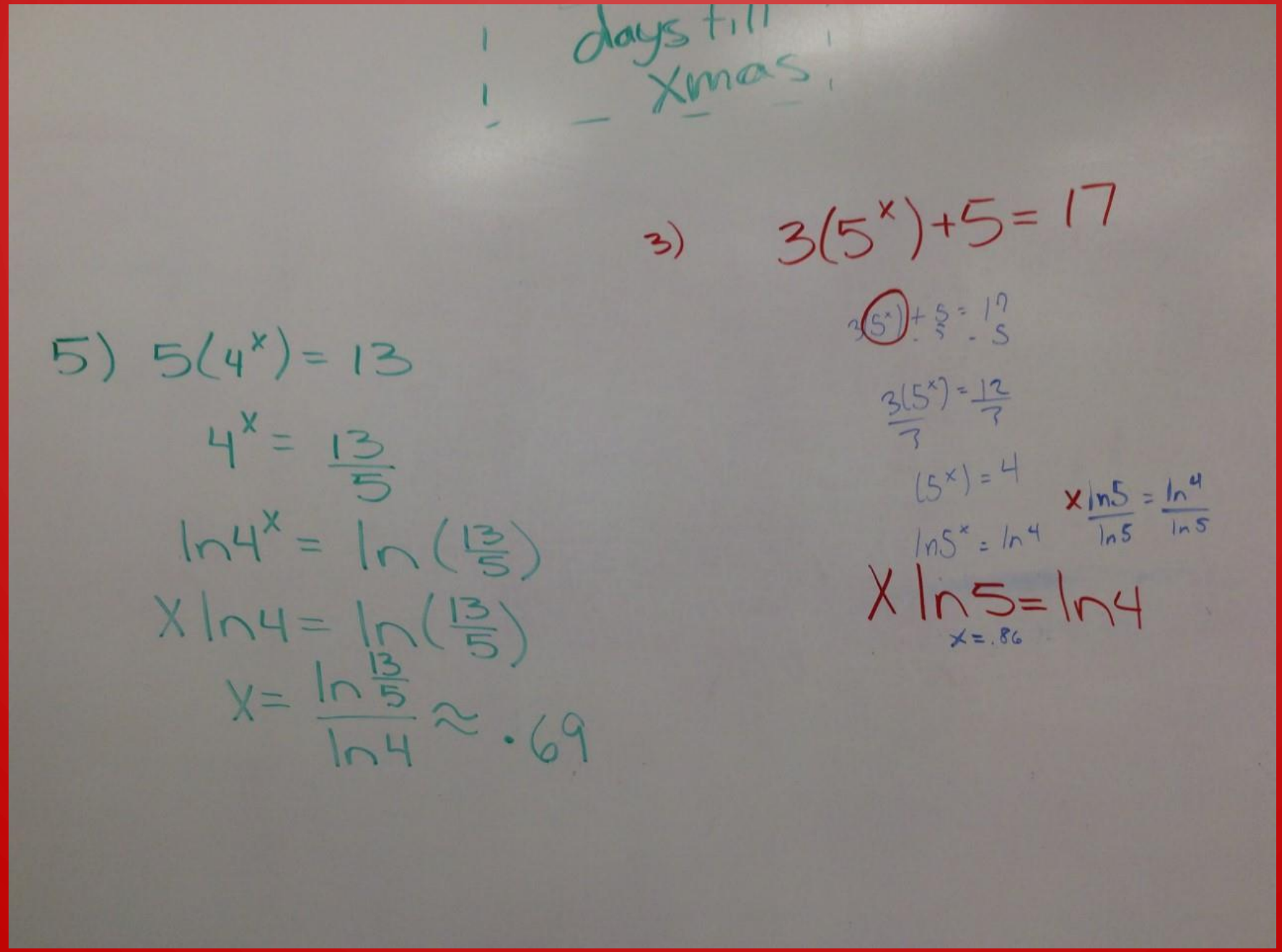
$4 \cdot \frac{x^2}{4} = 16 \cdot 4$

$(x^2)^{1/2} = (64)^{1/2}$

$x = 8$

± 8


2) $\log_2 x + \log_2 8 = 8$
$\log_2 x + \log_2 8 = 8$
$\log_2 8x = 8$ (1)
$2^8 = 8x$
$x = 32$
PRODUCT
DEFN


days till
Xmas
3) $3(5^x)+5=17$
$-5 \quad -5$
$\frac{3(5^x)}{3}=\frac{12}{3}$
$(5^x)=4$
$\ln 5^x = \ln 4$
$x\frac{\ln 5}{\ln 5}=\frac{\ln 4}{\ln 5}$
$x=.86$
$x\ln 5=\ln 4$
5) $5(4^x)=13$
$4^x=\frac{13}{5}$
$\ln 4^x=\ln(\frac{13}{5})$
$x\ln 4=\ln(\frac{13}{5})$
$x=\frac{\ln\frac{13}{5}}{\ln 4}\approx .69$

$\log_2(x-3) = 3\log_2 4$

(6) $\log_2 x - 3 = 3\log_2 4$

$\log_2 x - \log_2 4^3 = 3$

$\log_2 \frac{x}{64} = 3$

$2^3 = \frac{x}{64}$

$x = 512$

4) 4.) $3\log 2 + \log x = \log 24$

$\log 2^3 x = \log 24$ (2)

POWER PRODUCT

$\frac{8x}{8} = \frac{24}{8}$

$\boxed{x = 3}$