Name:	KEY
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Topic: 8.4 Logarithmic Functions

Summary:

Let b and y be positive numbers, b≠ 1. The logarithm of y with base b is denoted by logby and is defined as follows:

$$log_b y = X$$
, then $b^* = y$

* Read as

"Log base

Rewrite the equation in exponential form.

1.
$$\log_2 16 = 4$$

2.
$$\log_3 27 = 3$$

$$3^3 - 27$$

$$3. \log_3 27 = 3$$

5.
$$\log_2 1 = 0$$

4.
$$\log_5 \frac{1}{5} = -1$$

* Negative Exponent Rule

6.
$$\log_3 \frac{1}{27} = -3$$

$$3^{-3} = \frac{1}{2.1}$$

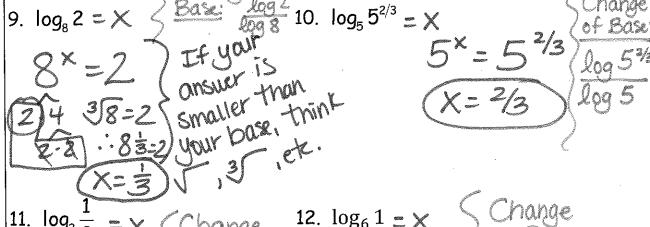
*Negative Exponent Rule

3-3= \frac{1}{33} = \frac{1}{27}

*Rewrite in Exponential Form, then "guess and Check" to Solve for x.

*You can also use "Change of Base" property of logarithms. $log_a B = log_a E = log_a$

7.
$$\log_2 4 = x$$
 Schange 8. $\log_2 32 = x$ Schange 2 of Base: $2^x = 32$ Schange $2^x = 32$



A logarithm with a base e is called the <u>Natural</u> logarithm, and is written:

$$\log_e x = \frac{\ln X}{\ln X}$$

A logarithm with a base of 10 is called the COMMON logarithm, and is written:

$$\log_{10} x = 200 X$$

AJUST to Plug in to Calculator

Evaluate the expression using a calculator. Round to three decimal places.

13. log 3.72

14. ln 0.23

15. $\ln \sqrt{3}$

0.511

-1.470

0.549

* If the of the bower is the connections of the connections.

In=loge

Simplify:

16. 4 log ×

(8)

17.
$$\log_5 125^x$$

log \$ \$ 3x



18.
$$10^{\log x}$$



Find the inverse of the function. *Switch x andy.

19.
$$f(x) = \log_3 x$$

20. $f(x) = \ln x$

Inverse:

X=loge y

21. $f(x) = \log_{1/3} x$

Inverse:

X=log & y

f(x)=y Inverse:

22. $f(x) = \log 2x$

23.
$$f(x) = \log_6(2x)$$

 $\frac{y-3}{24. \ f(x) = \log_4 16x}$ $y = \log_4 16x$ $y = \log_4 16x$

Inverse: