Math Poker

Unit 7 Review

I can find the inverse of a function or relation.
I can solve exponential equation.
I can determine if a function represents exponential growth or decay.
I can describe the transformations and graph exponential functions .

Solve.

4.

5.

6.

CHALLENGE

Oh my.....
where do I start?

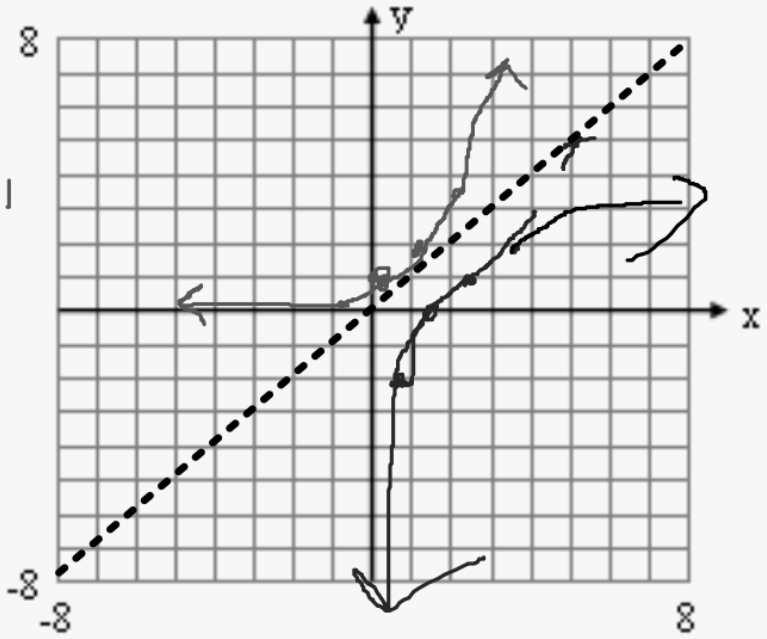
Logarithms (Section 7.3)

I can evaluate logarithmic expressions.

Exponential Function: $y = 2^x$

X	Y
-2	$\frac{1}{4}$
0	1
1	2
2	4

2^{-2} 2^0 2^1 2^2



Inverse of $y = 2^x$ is

(interchange x & y)

X	Y
$\frac{1}{4}$	-2
1	0
2	1
4	2

Logarithms (Section 7.3)

I can evaluate logarithmic expressions.

In general, inverse of $y = b^x$ is $x = b^y$. In $x = b^y$, y is called the <u>logarithm</u> of x. It is usually written as

$$y = \log_b x$$

x part called the argument

(read as: y = log base b of x)

start at base

$$\log_b x = y \quad \text{if and only if} \quad b^y = x$$

logarithmic form

exponential form

Ex.1) Write each equation in <u>exponential form.</u>

a. $\log_3 9 = 2$

$3^2 = 9$

b. $\log_{10} \frac{1}{100} = -2$

$10^{-2} = \frac{1}{100}$

Logarithms (Section 7.3)

I can evaluate logarithmic expressions.

Ex. 2) Write each equation in logarithmic form.

a. $5^3 = 125$

$\log_5 125 = 3$

b. $27^{\frac{1}{3}} = 3$

$\log_{27} 3 = \frac{1}{3}$

Ex. 3) Evaluate. (#)

a. $\log_3 243 = 5$

$\log_3 243 = n$

$3^n = 243$

$3^n = 3^5$

$n = 5$

b. $\log_8 64 = 2$

$8^n = 64$

$8^n = 8^2$

$n = 2$

c. $\log_4 \frac{1}{64} = -3$

$\log_4 \frac{1}{64} = n$

$4^n = \frac{1}{64}$

$4^n = 4^{-3}$

$n = -3$

Logarithms (Section 7.3)

I can evaluate logarithmic expressions.

General form: $y = \log_b x$ — *Argument of logarithm*

Properties of Logarithmic Functions

1. Function is continuous and one-to-one
2. Domain: $(h, +\infty)$ — *Argument of logarithm must be positive!*
3. x = h is asymptote (vertical)
4. Range: $(-\infty, +\infty)$

$$y = a\log_b(x - h) + k$$

Logarithms (Section 7.3)

I can evaluate logarithmic expressions.

Inverse Property of Exponential and Logarithmic Functions

$f(x) = b^x$ and $g(x) = \log_b x$ are inverses, therefore their compositions are the identity function

$[f \circ g](x) = \quad x$ $\qquad$ $[g \circ f](x) = \quad x$

matching bases

$$b^{\log_b x} = x \text{ and } \log_b b^x = x$$

Logarithms (Section 7.3)

I can evaluate logarithmic expressions.

$$b^{\log_b x} = x \quad \text{and} \quad \log_b b^x = x$$

Ex. 4) Evaluate.

a. $\log_9 9^2 = 2$

b. $7^{\log_7 (x^2-1)} = x^2-1$