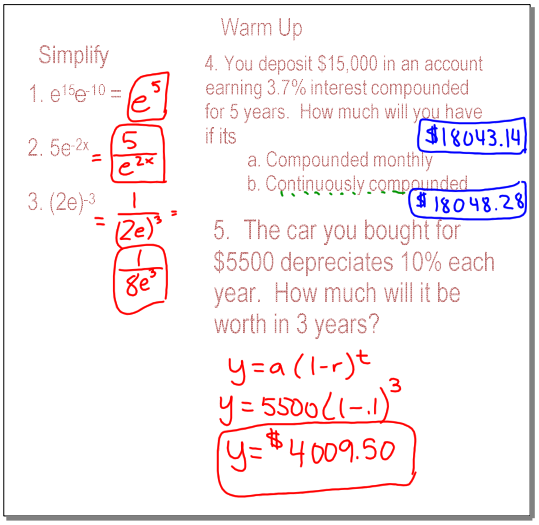

Apr 1-12:23 PM

7.4 Logarithms

IF $2^2 = 4$ and $2^3 = 8$,

THEN $2^x = 6$?

How do I algebraically get the unknown when its an exponent?

Feb 20-9:45 AM

7.4 Logarithmic functions

Logarithm Defined:

"the exponent that indicates the power to which a base number is raised to produce a given number <the *logarithm* of 100 to the base 10 is 2>"

In simpler terms - a logarithm is an exponent

Feb 18-10:10 PM

Base$^{\text{Exponent}}$ = Answer → Exponent Form

$2^3 = 8$

$\log_{\text{Base}}\text{Answer} = \text{Exponent}$ → Logarithmic Form

$\log_2 8 = 3$

We say "log base two of 8 equals 3

Feb 22-2:12 PM

FIRST JOB is re-writing equations from exponential to logarthmic form and back again

Logarithmic Form	Exponential Form
a. $\log_2 8 = 3$	$2^3 = 8$
b. $\log_4 1 = 0$	$4^0 = 1$
c. $\log_{12} 12 = 1$	$12^1 = 12$
d. $\log_{1/4} 4 = -1$	$\left(\frac{1}{4}\right)^{-1} = 4$

Feb 18-10:11 PM

Rewrite the equation in exponential form.

1. $\log_3 81 = 4$ → $3^4 = 81$
2. $\log_7 7 = 1$ → $7^1 = 7$
3. $\log_{14} 1 = 0$ → $14^0 = 1$
4. $\log_{1/2} 32 = -5$ → $\left(\frac{1}{2}\right)^{-5} = 32$

2^5

Feb 22-2:17 PM

2nd JOB is evaluating logarithmic functions without a calculator

Ex. $\log_4 64 =$ X (add) → $4^x = 64$ (rewrite) → $x = 3$

$\log_{12} 12 =$ X → $12^x = 12$ → $x = 1$

$\log_2 32 =$ X → $2^x = 32$ → $x = 5$

$\log_{1/5} 125 =$ X → $\left(\frac{1}{5}\right)^x = 125$ → $x = -3$

$\log_{36} 6 =$ X → $36^x = 6$ → $x = \frac{1}{2}$

$\sqrt[3]{x} = x^{\frac{1}{2}}$

Feb 22-2:22 PM

3rd job Practice Evaluating with a calculator

(make sure you know how to with a calculator as well)

Calculator assumes a base of 10

$\log 17 =$ 1.2304

$\log 2 =$ .301

Feb 22-2:25 PM

Some simple facts.

COMMON LOGARITHM is a logarithm with base 10

$\log_{10} x = \log x$ (if there's no base ⇒ assume 10)

NATURAL LOGARITHM is a logarithm with base "e"

$\log_e x = \ln x$

Find ln on your calculator $\ln 22 = 3.09$

Feb 22-2:26 PM

4th Job Finding/Using INVERSES of Functions

The logarithmic function
$g(x) = \log_b x$
is the INVERSE of the exponential function
$f(x) = b^x$

$g(x) = \log_b x$ $f(x) = b^x$ (POSITIVE)

$g(f(x)) = \log_b b^x = x$ answer is exp

$f(g(x)) = b^{\log_b x} = x$ (same) answer is answer on exponent

HW (34) $\log_5 125^x =$ (rewrite) $\log_5 5^{3x} = 3x$

Feb 22-2:31 PM

If Exponential and Logarithmic Functions are Inverses to one another ... we can use this to help us solve.

$g(x) = \log_b x$
$f(x) = b^x$

$g(f(x)) = \log_b b^x = x$

$f(g(x)) = b^{\log_b x} = x$

Mar 31-12:45 PM

Your book is not your friend in the section.

It is your enemy.

Mar 31-12:42 PM

Apr 27-8:52 AM

Find the inverse:

switch forms

1st Switch x & y then switch forms

1. $y = 6^x$

$x = 6^y$

$\log_6 y = x$

2. $y = \ln(x+3)$

$x = \ln(y+3)$

$e^x = y + 3$

$e^x - 3 = y$

Feb 22-3:55 PM

HW Pg 503

#3-6

#8-19

#24,25

properties #28-31 no stress

Apr 6-11:44 AM