

Hw expand
 p510
 #25 $\ln x^2 y^{\frac{1}{3}}$
 $2\ln x + \frac{1}{3}\ln y$
 condense
 #39 $\ln 40 + 2\ln \frac{1}{2} + \ln x$
 only "ln"
 $\ln 40 \cdot (\frac{1}{2})^2 \cdot x$
 $\ln 40 \cdot \frac{1}{4} \cdot x$
 $\ln 10x$
 cond

Apr 19-11:19 AM

7.6 Solve Exponential and Logarithmic Equations

→ If things are equal - they're equal
 ***You may have to make them equal
 → Rewrite from Exponential to Logarithmic or Back again.

$\text{answ} = \text{base}^{\text{exp}}$ $\text{base}^{\text{exp}} = \text{answ}$
 $\text{exp} = \log_{\text{base}} \text{answ}$ $\log_{\text{base}} \text{answ} = \text{exp}$

Feb 22-4:19 PM

1st method for solving
 If the bases are the same then the exponents must be equal

Ex 1 $4^{x+4} = 4^{2x-1}$

$x+4 = 2x-1$
 $5 = x$

Feb 22-4:33 PM

Solve *You may need to make the bases equal

Ex 2 $4^{3x} = 8^{x+1}$

Rewrite $2^2 = 4$ rewrite $2^3 = 8$ No mu (high) !!
 $(2^2)^{3x} = (2^3)^{x+1}$
 $2^{6x} = 2^{3x+3}$
 $6x = 3x+3$
 $x = 1$

Mar 3-9:00 PM

Ex 3 Rewrite!

Solve $4^x = (1/2)^{x-3}$

$(2^2)^x = (2^{-1})^{x-3}$
 $2^{2x} = 2^{-x+3}$
 $2x = -x+3$
 $3x = 3$
 $x = 1$
 $(x^3)^4 = x^{12}$

Mar 2-8:15 PM

Practice Time

Solve the equation.

1. $9^{2x} = 27^{x-1}$ 2. $100^{7x+1} = 1000^{3x-2}$ 3. $81^{3-x} = (\frac{1}{3})^{5x-6}$

Feb 22-4:35 PM

2nd method of solving - If logs & bases are equal then expressions are equal

Ex 1

$$\log_4(x+2) = \log_4(3x-1)$$

$$(x+2) = (3x-1)$$

$$\begin{array}{r} 3 - 2x \\ 3 = x \\ 2 \end{array}$$

Feb 22-4:39 PM

Ex 2 Solve a logarithmic equation

Solve $\log_5(4x - 7) = \log_5(x + 5)$.

$\log_5(4x - 7) = \log_5(x + 5)$	Write original equation.
$4x - 7 = x + 5$	Property of equality for logarithms
$3x - 7 = 5$	Subtract x from each side.
$3x = 12$	Add 7 to each side.
$x = 4$	Divide each side by 3.

Feb 22-4:27 PM

Ex 3

Solve: $\log_3(5x - 1) = \log_3(x + 7)$

$$(5x - 1) = (x + 7)$$

$$5x = x + 7 + 1$$

$$5x - x = 8$$

$$4x = 8$$

$$x = 2$$

Mar 3-9:08 PM

3rd method for solving
Rewrite from exp to log or
log to exp

Ex 1

$4^x = 11$
base exp ans exponential

Switch to logarithmic

$\log_4 11 = x$

Need Change of Base

$$\frac{(\log 11)}{(\log 4)} = 1.73$$

Feb 22-4:34 PM

Ex 2 Solve

$$2^x = 7$$

$$\log_2 7 = x$$

$$\frac{\log 7}{\log 2} = x$$

$$2.807$$

Mar 3-9:04 PM

Ex 3

Solve $10^{2x-3} + 4 = 21$

*Isolate your base
before you
rewrite to
log...
or ln...

Need 3 parts before subtract error double

$$10^{2x-3} + 4 = 21$$

$$10^{2x-3} = 17$$

$$\log_{10} 17 = 2x - 3$$

$$\log 17 = 2x - 3$$

$$1.23 = 2x - 3$$

$$4.23 = 2x$$

$$2.115 = x$$

Change Base $\frac{\log 17}{\log 10} = 2x - 3$

Mar 3-9:06 PM

Ex 4

$$\log_2 x = 5$$

answ
base

$$2^5 = x$$

$$32 = x$$

Ex 5 $\log_2(3x+2) = 5$

base *answ* *exp*

$$2^5 = 3x+2$$

$$32 = 3x+2$$

$$30 = 3x$$

$$10 = x$$

Apr 7-8:55 AM

What makes this hard...
Choosing which method to use
Ignore instructions in book homework

#37
p 520

Condense

$$\log_2 x + \log_2(x-2) = 3$$

$$\log_2 x(x-2) = 3$$

$$\log_2(x^2-2x) = 3$$

Switch forms

$$2^3 = x^2 - 2x$$

$$8 = x^2 - 2x$$

$$0 = x^2 - 2x - 8$$

$$0 = (x-4)(x+2)$$

NP $\log_2 -2 = x$

$x=4$ $x=-2$ *extraneous*

Review
Extraneous
Solutions
p 518

Apr 7-7:49 AM

HW Pg 519, #3-42

Multiples of 3

May 5-9:31 AM