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NOTES: Section 7.6 – Solve Exponential and Logarithmic Equations

Goals: #1 - I can solve an exponential equation by rewriting both sides with a common base.

#2 - I can solve an exponential equation by taking a logarithm of both sides.

#3 - I can solve a logarithmic equation by canceling out logarithms.

#4 - I can solve a logarithmic equation by using exponents.



Homework: Lesson 7.6 Worksheet

Warm Up:

1. Expand the expression.
   a. $\log_3 15x$
   b. $\ln \frac{\sqrt[3]{x}}{y^2}$

2. Condense the expression.
   a. $5\log_2 x - 4\log_2 y$
   b. $\ln 4 + 3\ln 3 - \ln 12$

Notes:

_____ are equations in which the _____ occurs in the _____.

Example:

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Example #1: Solve the exponential equation.

1. $4^x = \left(\frac{1}{2}\right)^{x-3}$
2. $100^{7x+1} = 1000^{3x-2}$

You practice: Solve the exponential equation.

1. $9^{2x} = 27^{x-1}$
2. $81^{3-x} = \left(\frac{1}{3}\right)^{5x-6}$

Notes:

How would we solve the equation $4^x = 11$?

We _____ write each side with the _____ base.

To solve these types of _____ equations, we will use _____.

Example #2: Solve the exponential equation.

1. $4^x = 11$
2. $4e^{-0.3x} - 7 = 13$

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You practice: Solve the exponential equation.

1. $2^x = 5$
2. $10^{3x} + 4 = 9$

Notes:

_____ are equations in which the _____ occurs in the _____.

Example:

Example #3: Solve the logarithmic equation.

1. $\log_5(4x - 7) = \log_5(x + 4)$
2. $\ln(7x - 4) = \ln(2x + 11)$

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Notes:

How would we solve the equation $\log_4(5x - 1) = 3$?

We _____ write each side with the _____ logarithmic base.

To solve these types of _____ equations, we will use _____.

Example #4: Solve the logarithmic equation.

1. $\log_4(5x - 1) = 3$
2. $\log 5x + \log(x - 1) = 2$

You practice: Solve the logarithmic equation.

1. $\log_2(x - 6) = 5$
2. $\log_4(x + 12) + \log_4 x = 3$

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Example #5: You deposit $100 in an account that pays 6% annual interest compounded daily. How long will it take for the balance to reach $1000?