p. 36-37 Solving Log Equations Special Bases 7.5

Warm-up: p. 36

Solve the following equation for x.

$$5^{2x} = 130$$

$$100 = 30$$

$$100 = 30$$

$$100 = 30$$

$$3.02 = 3x$$

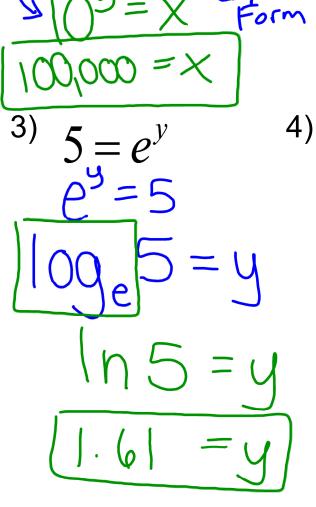
$$1.51 = x$$

p. 37

We have discussed how to solve equations by rewriting to exponential form and to logarithmic form. We have also learned how to evaluate logs using Change of Base Formula. There are 2 special bases we need to be familiar with in order to solve equations.

The "common," or base-10 log	The "natural", or base- e log
$\log_{10} x$ is often written as $\log x$	$\log_e x$ is often written as $\ln x$
If a log has no base written, assume that the base is 10.	If you see "ln" assume that the base is e.
log ₁₀ 100	log _e 8
can be written as	can be written as
100 100	(n 8

Examples:



$$\frac{\ln x = 6}{\log_e x} = 6$$

$$e^{\circ} = x$$

$$403.43 = x$$

Algebra 2 In-class Homework Solving Equations — Special Bases

Name: _____ Period: ____

Change of Base Formula

LOGARITHMIC FORM

EXPONENTIAL FORM

$$\log_b x = \frac{\log x}{\log b}$$

$$\log_b y = x$$

$$b^x = v$$

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Part I – Write each equation in exponential form

1.)
$$\log 1000 = 3$$

2.)
$$\ln e^5 = 5$$

3.)
$$\log_5 125 = 3$$

4.)
$$\ln 1 = 0$$

5.)
$$\log 0.001 = -3$$

6.)
$$\log 10 = 1$$

Part II – Write each equation in logarithmic form

7.)
$$3^4 = 81$$

8.)
$$10^5 = 100,000$$

9.)
$$e^0 = 1$$

10.)
$$10^{-2} = 0.01$$

11.)
$$e^1 = e$$

12.)
$$4^3 = 64$$

Part III - Mixed Practice Solving. If necessary, round to the nearest hundredths.

13.)
$$\log_8(x+25)=2$$

14.)
$$12\log(2x-30)=36$$
 15.) $\ln(3x)=2$

15.)
$$ln(3x) = 2$$

16.)
$$-3\log_2(x-3) = -18$$

7.)
$$\log x = 1.$$

16.)
$$-3\log_2(x-3) = -18$$
 17.) $\log x = 1.7$ **18.**) $40e^{1.25x} - 200 = 2000$

19.)
$$7 \ln 2x = 21$$

20.)
$$10\log_8(4x-12)=30$$
 21.) $100 \cdot e^{0.2x}=300$

21.)
$$100 \cdot e^{0.2x} = 300$$