

Unit 4 Study Guide

Convert the equation to logarithmic form: $42 = x^3$

Convert the equation into exponential form: $\log_{64}16 = \frac{2}{3}$

Evaluate:

$\log_{64}8$	$\log_{16}\frac{1}{2}$	$\log_{17}17$	$\log_4 - 8$
$\log_3\frac{1}{81}$	$9^{\log_9 81}$	$\log_5 27$	$e^{\ln 6}$
$\ln \cdot e^{32}$	$\frac{\ln \cdot e^6}{18}$	$3.5e^4$	e^5

Condense:

$\log_3 x + \log_3 x$	$2\log_4 x + \log_4(x + 2)$	$\log_5(x + 1) + \log_3(x + 2)$
$\log(x^2 - 4) - \log(x + 2)$	$\ln 4x + 3\ln x$	$3\ln x - 2\ln x$

Expand:

$\log_2 5x^2$	$\log \frac{5x}{y}$	$\log \sqrt{\frac{m}{n}}$
$\log 2x^3y$	$\ln x^3y^2$	$\ln \sqrt[3]{mn}$

Solve the following Exponential Equations:

$4^3 = 2^x$	$3^{5x-6} = 81$	$3^{x-11} = 7$
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Solve the following Logarithmic Equations:

$\log_3(4x - 3) = 4$	$\log(2x + 6) = \log(2x^2 + 7x - 6)$	$\log x - \log 9 = \log 18$
$\log(x + 3) + \log(x + 4) = \log x + \log(x + 8)$		$\log(3x + 7) = 3$

Solve the following Equations:

$4e^x - 3 = 6$	$e^3 \cdot e^x = 15$
$\ln(3x + 4) = 9$	$\ln 4x + \ln 2x = 8$

Exponential Growth/Decay

- 1.) Determine if the following functions are grow or decay.
- 2.) Determine the growth or decay factor as a **percent**.

$f(x) = 6(1.04)^x$	$f(x) = 11(.86)^x$
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In 2010, there was a population 2165 mice and they are decreasing at a rate of 17% per year.

- a. Write an exponential function for this model.
- b. Predict how many mice there will be this year.
- c. When will there be 1200 mice?

Iron-59 is used in medicine to diagnose blood circulation disorders. The half-life of iron-59 is 44.5 days.

- a. Write an exponential function that models the decay of this substance?
- b. How much of a 2.0 mg sample will remain after 133.5 days?
- c. How long will it take to have a 2.5 mg of iron-59 left over?

You saved \$2500 from your summer job. Which option yields more money? What is the positive difference between the 2 options?

<p>Option 1: A traditional savings account at 3.5% interest compounded monthly for 5 years.</p>	<p>Option 2: A savings account with 4.2% interest compounded continuously for 4 years.</p>
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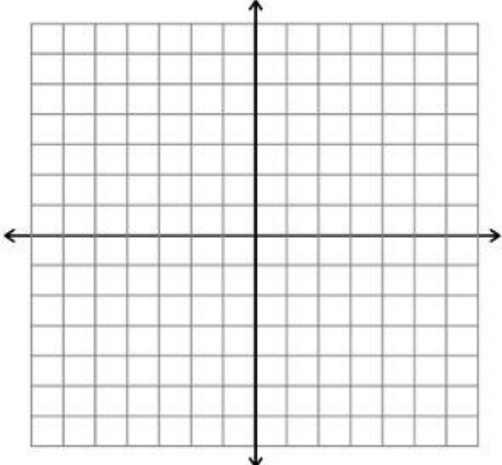
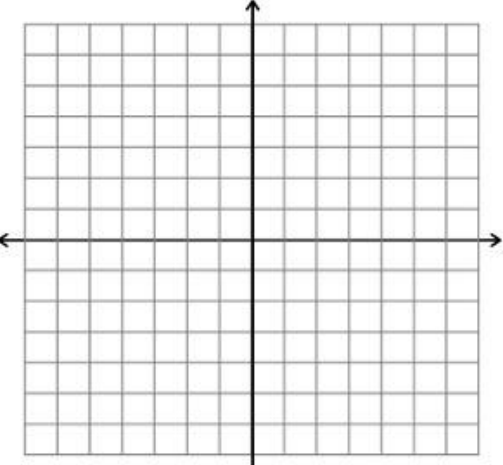
Find the inverse of the following function:

$$f(x) = \log_5(x - 2) + 4$$

Find the inverse of the following function:

$$f(x) = 3^{x+3} - 5$$

Graph:

<p>$f(x) = \log_5(x - 2) + 4$ Identify: Parent Function: Evaluate: $f(7) =$ Transformation: Key Point: Additional Point: Equation of Asymptote: Domain: Range:</p> 	<p>$f(x) = 3^{x+3} - 5$ Identify: Parent Function: Evaluate: $f(3) =$ Transformation: Key Point: Additional Point: Equation of Asymptote: Domain: Range:</p> 
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