

## Sections 4.1, 4.2

1. Rewrite each of the following logarithmic expressions in exponential form.

a.  $\log_7 343 = 3$

b.  $\ln x = 3$

c.  $\log(x) = y$

2. Rewrite each of the following exponential expressions in logarithmic form.

a.  $3^2 = 9$

b.  $P = e^{2t}$

c.  $\sqrt{36} = 6$

3. Use the change of base formula to estimate the value of the following expressions. Round your answers to three decimal places.

a.  $\log_5 37 =$  \_\_\_\_\_

b.  $\log_{\frac{1}{2}} 108 =$  \_\_\_\_\_

4. Tell whether each statement involving logarithms is **true** or **false**. If the statement is false, correct it. (Assume  $a$ ,  $b$ ,  $x$ ,  $y$  and  $z$  are positive.)

a.  $\log \sqrt{x} = \frac{1}{2} \log(x)$  \_\_\_\_\_

b.  $\log\left(\frac{x}{yz}\right) = \log(x) - \log(y) + \log(z)$  \_\_\_\_\_

c.  $\log(100) = 2$  \_\_\_\_\_

d.  $\log \frac{1}{x^3} = -3 \log(x)$  \_\_\_\_\_

e.  $\log(xy^2) = 2(\log(x) + \log(y))$  \_\_\_\_\_

f.  $\log(a + b) = \log(a)\log(b)$  \_\_\_\_\_

g.  $\log(a) - \log(b) = \frac{\log a}{\log b}$  \_\_\_\_\_

g.  $\ln e^{5x} = 5x$  \_\_\_\_\_

5. Fill in the table below.

$f(x)=ab^x$	$f(x)=ae^{kx}$	Initial Value	Annual Rate	Continuous Rate
	$f(x) = 56e^{.1x}$			
	$f(x) = 77e^{-.1x}$			
$f(x) = 59(1.07)^x$				
$f(x) = 67(.72)^x$				

6. Solve the following equations for x.

a.  $500(1.08)^x = 600$

b.  $35=70e^{-0.14x}$