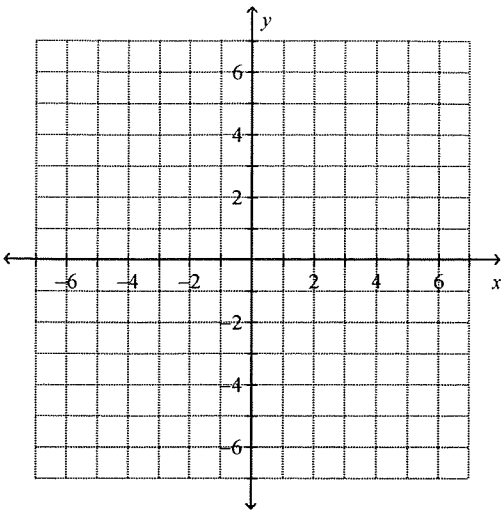
Name _____ Date _____

Review 5.1-5.3:



1. Sketch and label the following graphs on the axes below.

a) $f(x) = log_3(x)$

b) $f(x) = log_3(-x)$

c) $f(x) = log_3(x) - 1$

d). $f(x) = -log_3(x + 2)$

e). $f(x) = 3^x$

2. Find the following.

a. $log_a(1) =$

b. $ln(1) =$

c. $log_a(a) =$

d. $ln(e) =$

e. $log_a(a^x) =$

f. $ln(e)^x =$

g. $log_a(uv) =$

h. $\qquad = ln(u) + ln(v)$

i. $\qquad = log(u) - log(v)$

j. $\ln\left(\frac{u}{v}\right) =$

k. $log_a(x)^n =$

l. $\qquad = n ln(x)$

3. Evaluate.

a. $log_4(64) =$

b. $ln(e^3) =$

c. $log_{49}(7) =$

d. $\log_3\left(\frac{1}{27}\right) =$

4. Use the definition of logarithms to rewrite the exponentials as logs

a. $3^4 = 81$

b. $e^4 = 54.6$

5. Use the change of base formula to rewrite the following as a quotient of common logs **and** natural logs.

a. $log_6(11) =$

b. $ln(5) =$

5. Use the properties of logarithms to rewrite the expressions as the sum or difference and/or the constant multiple of logs.

a. $log\,(3x)$

b. $\ln\left(\frac{x}{e}\right)$

c. $\log\left(\frac{\sqrt{x}}{z^2}\right)$

d. $\ln\left(x^3 \bullet \sqrt{e}\right)$

6. Use the properties of logarithms to rewrite the expressions as a single log.

a. $log_6(7) + log_6(5)$

b. $ln(24) - ln(3)$

c. $\frac{1}{2}\log(x) - 5\log(y)$

d. $6\ln(x) - 2\ln(y) - \frac{1}{3}\ln(z)$

7. Find the exact value of the following logs.

a. $2\log\sqrt{x} - \log(x)$

b. $6ln(e^2)$

c. $log_4\,(16)^{2.5}$

d. $\ln(1)^5 + 2\ln(e)^2 - 3\ln(e^4)$

Extra Credit. Simplify

a. $4\log(10) - \frac{1}{2}\log(1{,}000{,}000{,}000)$

b. $2\ln(\sqrt{e} \bullet x^2) - \frac{1}{2}\ln(e^2 \bullet x^8)$