Advanced Math

3-3
Laws of Logarithms

The answer to a logarithm is __a power__.

Laws of Exponents	Laws of Logarithms -
1) $x^m x^n = x^{m+n}$	1) $\log_b M + \log_b N = \log_b(MN)$
2) $\dfrac{x^m}{x^n} = x^{m-n}$	2) $\log_b M - \log_b N = \log_b \dfrac{M}{N}$
3) $(x^m)^n = x^{mn}$	3) $\log_b M^n = n \log_b M$

Evaluate the logarithm. Round to three decimal places.

11) $\log_3 7 = x$

$3^x = 7$

$x \ln 3 = \ln 7$

$x = \dfrac{\ln 7}{\ln 3} = \boxed{1.771}$

Use laws of logarithms to write the expression as a sum, difference, and/or constant multiple of logarithms.

31) $\ln z(z-1)^2, z > 1$

$\ln z + \ln(z-1)^2$

$\boxed{\ln z + 2\ln(z-1)}$

Express as a logarithm of a single number or expression.

49) $\ln x - 3\ln(x+1)^3$

$\hookrightarrow$ means divide

$\ln \dfrac{x}{(x+1)^3}$

Find the exact value of the logarithm if possible without a calculator.

75) $\log_5 75 - \log_5 3$

$\log_5 \dfrac{75}{3} = \log_5 25 = x$

$5^x = 25$

$\boxed{x = 2}$

Assignment:
pg 325
12-38 even,
42-60 even,
70-82 even.