

MAC 1140 –Precalculus Algebra
LA sessions

Week 8

1. Evaluate the expressions without using a calculator

a) $\log_2 6 - \log_2 15 + \log_2 40$

b) $\log(\log 10^{1000})$

2. Use the Laws of Logarithms to expand following logarithms

a) $\log_3 \frac{a^2}{b^5 \cdot \sqrt[3]{c^2}}$

b) $\ln \frac{x^2 \sqrt{2x-1}}{(x^2+3)^5}$

c) $\log \sqrt{x \sqrt{y \sqrt{z}}}$

3. Use the Laws of Logarithms to write as a single logarithm

a) $2 \ln a + 3 \ln b - \frac{1}{2} \ln c - \frac{1}{3} \ln d$

b) $2 \log_5 x - \frac{1}{2} \log_5 (3x+5) - \log_5 (x^2+4)$

4. Solve the following equations

a) $e^{3x} = 12$

b) $3(2 + 4^{3x}) = 7$

c) $2^{3x-1} = 5^{x-3}$

d) $x^2 3^x - 2 \cdot 3^x = 0$

e) $2 \cdot 4^{2x} + 4^x - 3 = 0$

f) $\log x + \log(x-1) = \log(4x)$

g) $\log_9(x-5) + \log_9(x+3) = 1$

5. Show that $\log_8 x = \frac{1}{3} \log_2 x$ (hint: use the change of the base formula). How are the graphs of

$f(x) = \log_8 x$ and $g(x) = \log_2 x$ related?

6. Use the transformations to graph $f(x) = 2 \ln(x+1) - 3$. Use the graph to solve the inequality $2 \ln(x+1) - 3 \geq 0$