Kerry Ojakian's MTH 30 Class
Class Assignment #16

1. Evaluate

   (a) $\log_{102} 102^4$

   (b) $\log_3(\log_8 2)$

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2. Simplify.

   (a) $\log_a a^{\frac{1}{5}}$

   (b) $\log_a \sqrt[3]{a}$

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3. Simplify.

   (a) $2^{\log_2 7}$

   (b) $a^{\log_a \frac{1}{5}}$

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4. Simplify.

   (a) $10^{\log \sqrt{4}}$

   (b) $e^{\ln 3x^2}$

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5. Use the properties of logarithms to expand the following expressions.

   (a) $\log_9(5y) =$

   (b) $\log_8 x^7 =$

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6. Use the properties of logarithms to expand the following expressions.

(a) $\log_b(3x^2y^3)$

(b) $\log_8 \dfrac{x^{\frac{1}{2}}}{y^3}$

7. Use the properties of logarithms to expand the following expressions.

(a) $\log_5 \sqrt[5]{\dfrac{x^2}{y}}$

(b) $\ln \left[\dfrac{x^4\sqrt{x^2+3}}{(x+3)^5} \right]$

8. Use the properties of logarithms to condense the following expressions.

(a) $\log x + \log 5 =$

(b) $\log_8 x + 3\log_8 y =$

9. Use the properties of logarithms to condense the following expressions.

(a) $\frac{1}{2}(\log x + \log y) =$

(b) $\frac{1}{3}(\log_7 x + 4\log_7 y) - 3\log_7(x+y) =$

10. Use the change of base formula to write the following logarithms as logarithms in the indicated base.

   (a) $\log_7 12$; write it in base 10.

   (b) $\log_9 127$; write it in base e.

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11. Use the change of base formula to write the following logarithms as logarithms in the indicated base.

   (a) $\log_{25} 9$; write it in base 5 and simplify.

   (b) $\log_{\frac{1}{2}} 8$; write it in base 2 and simplify.