Name: _____ Date: _____ IB Math A&A SL

Lesson 3.4 - Introduction to Logarithms

## I. What are Logarithms?

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1. Evaluate the following without a calculator.
   a. $\log_2(16)$
   b. $\log_{10}(1)$
   c. $\log_3(27)$
   d. $\log_8(8)$
   e. $\log_4(2)$
   f. $\log_{10}\left(\frac{1}{1000}\right)$

2. Use a calculator to find the following.
   a. $\log_{10}(10)$ b. $3 \cdot \log_{10}(2)$ c. $\log_{10}(-4)$

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## II. Properties of Logs:

a. $\log_a(1)$ = b. $\log_a(a)$ = c. $\log_a(a)^x$

What does the "common logarithm" mean?

What does the "natural logarithm" mean?

## III. Rewriting from logarithmic form to exponential form

3. Solve each logarithmic equation:
   a. $\log_{16}(x) = \frac{3}{4}$
   b. $\ln(x) = 2$
   c. $6 \cdot \log_3(x+1) = 13$

4. Solve each exponential equation:

   a. $5^x = 30$ b. $e^x = 7$ c. $5 \cdot 7^x = 3$

## IV. Practice

5. $\log_4(x+1) = -\frac{1}{2}$

6. $2(6^{5x}) = 120$

7. $\ln(x) - 1 = 7$

8. $4e^x = 91$