



Unit 05a: Mathematics 1 **Tutoring Sheet #4**
Basics IV – Logarithms/Exponential

1. Translate each logarithmic statement into an equivalent exponential statement:

1. $\log 1000 = 3$
3. $\log_3 81 = 4$
5. $\ln e = 1$

2. $\log 0.01 = -2$
4. $\log_2 \frac{1}{4} = -2$

2. Translate each exponential statement into an equivalent logarithmic statement:

1. $3^{-2} = 1/9$
3. $10^{1.8751} = 75$

2. $16^{1/2} = 4$
4. $e^{3.2189} = 25$

3. Without using a calculator, evaluate each of the following:

1. $\log 100$

2. $\log 0.001$

3. $\log_5 25$

4. $\log_3 1/27$

5. $\ln 1/e$

6. $\ln \sqrt{e}$

4. Express each of the following in terms of $\ln x$ or $\ln y$ only:

1. $\ln(x^2y^5)$

2. $\ln(\sqrt{xy})$

3. $\ln(\sqrt{x}/y)$

5. Solve each of the following equations :

1. $\log_3 (5x+1) = 2$

2. $\log x - \log (x+3) = -1$

3. $\log(x-1) + \log(x+2) = 1$

4. $\ln (2x - 3) = 2$

5. $e^{3x-2} = 5$

6. $e^x + e^{-x} = -2$

7. $e^{2x} - e^x = 0$

8. $4^{x+2} = 2^{x-1}$

9. $10e^{3x-5} = 7$

10. $3^x = 5$

11. $(\log x)^2 - \log x^2 = 0$

12. $2^x = 3^{x-1}$

13. $\ln(4x-2) = \ln 4 - \ln(x-2)$

14. $\log(-x) = -4$

15. $\log(x+4) - \log(x+2) = \log x$

16. $e^{x^2} = 100$

17. $2^{x-8} = 32$

18. $3^{2x-1} = 1/81$