NudgeLearn

Algebra 2 · Math

Logarithms

HSF.LE.A.4 HSF.BF.B.5

Name _____ Date _____

Show your work in the space provided. By definition $\log_b x = y$ means $b^y = x$. Leave answers in exact form unless a decimal is requested.

1. Rewrite $\log_2 32 = 5$ as an exponential equation.

2. Rewrite $3^4 = 81$ as a logarithmic equation.

3. Evaluate $\log_2 64$.

4. Evaluate $\log_5 \frac{1}{25}$.

5. Evaluate $\log_8 2$.

6. Evaluate $\ln e^4$.

7. Expand $\log_3(9x)$ using the product property.

8. Expand $\log\left(\frac{x^2}{y}\right)$ as a difference of logarithms.

9. Expand $\ln\left(\dfrac{x^3 y}{z}\right)$ completely.

10. Condense $\log_2 5 + \log_2 3$ into a single logarithm.

11. Condense $3\log x - \log y$ into a single logarithm.

12. Condense $\frac{1}{2}\ln x + 2\ln y$ into a single logarithm.

13. Use the change-of-base formula to write $\log_3 20$ as a quotient of common logarithms (base 10).

14. Use the change-of-base formula to evaluate $\log_4 64$ as a quotient, then simplify.

15. Approximate $\log_2 50$ to the nearest hundredth using the change-of-base formula.

16. The pH of a solution is $\mathrm{pH} = -\log[\mathrm{H}^+]$, where $[\mathrm{H}^+]$ is the hydrogen-ion concentration. Find the pH when $[\mathrm{H}^+] = 10^{-4}$.