1. What question would you ask yourself to evaluate $\log_3 81$?

2. If you know the value of $\log 5$ and $\log 7$, show how you can find the value of $\log 5$ without using the log function on a calculator.

3. Identify the error in the following process. Show the correct steps to rewrite $\log \left(1 + \frac{64}{x^3}\right)$ as a sum or difference of logarithms.

$$\log \left(1 + \frac{64}{x^3}\right) = \log(1) - \log \left(\frac{64}{x^3}\right) = -\log 64 + 3 \log x$$
4. Use a graphing calculator to demonstrate the power property of logarithms. Explain what you did and what you noticed.

5. Explain why $\log \left( \frac{30}{6} \right) \neq \frac{\log 30}{\log 6}$.

6. Write an equation using an exponent. Then write the related logarithmic equation.

7. Write a single logarithm as a sum of two logarithms.
[1] What power of 3 is equal to 81?

[2] \( \log 5 = \log(35 + 7) \); \( \log 5 = \log 35 - \log 7 \)

\[
\log \left(1 + \frac{64}{x^3}\right) \neq \log(1) - \log \left(\frac{64}{x^3}\right)
\]

The correct steps are

\[
\log \left(1 + \frac{64}{x^3}\right) = \log \left(\frac{x^3 + 64}{x^3}\right) = \log \left(\frac{(x + 4)(x^2 - 4x + 16)}{x^3}\right) = \log(x + 4) + \log(x^2 - 4x + 16) - 3\log x
\]

[3] Answers may vary. Sample: Graph \( y = 2 \log x \) and \( y = \log x^2 \) on the same set of axes.

[4] By the quotient property of logarithms, \( \log \left(\frac{30}{6}\right) = \log 30 - \log 6 \).

[5] Answers may vary. Sample: \( 1000 = 10^3 \); \( \log_{10} 1000 = 3 \)

[6] Answers may vary. Sample: \( \log 14 = \log 2 + \log 7 \)