Name _____ Date _____

5.4 Practice A

In Exercises 1–3, use $\log_5 3 \approx 0.683$ and $\log_5 6 \approx 1.113$ to evaluate the logarithm.

1. $\log_5 2$ **2.** $\log_5 18$ **3.** $\log_5 9$

In Exercises 4–6, expand the logarithmic expression.

4. $\log_2 5x$ **5.** $\log 7x^4$ **6.** $\log_6 \frac{2x}{y}$

7. Describe and correct the error in expanding the logarithmic expression.

$\log_4 3x = 3 \log_4 x$

In Exercises 8–11, condense the logarithmic expression.

8. $\log_7 3 - \log_7 5$ **9.** $\log 10 - \log 5$

10. $3 \ln x + 9 \ln y$ **11.** $\log_2 9 + \frac{1}{2} \log_2 y$

In Exercises 12–14, use the change-of-base formula to evaluate the logarithm.

12. $\log_5 3$ **13.** $\log_2 11$ **14.** $\log_6 10$

15. Your friend claims that you can use the change-of-base formula to write the expression $\ln x$ as a common logarithm. Is your friend correct? Explain your reasoning.

16. For a sound with intensity I (in watts per square meter), the loudness $L(I)$ of the sound (in decibels) is given by the function $L(I) = 10 \log \frac{I}{I_0}$, where I_0 is the intensity of a barely audible sound (about 10^{-12} watts per square meter). The sound of a coach's whistle is five times greater than the intensity of the referee's whistle. Find the difference in the decibel levels of the sounds made by the coach and the referee.

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