Name_____ Date _____

6.5 Notetaking with Vocabulary (continued)

Extra Practice

In Exercises 1–4, use $\log_2 5 \approx 2.322$ and $\log_2 12 \approx 3.585$ to evaluate the logarithm.

1. $\log_2 60$

2. $\log_2 \frac{1}{144}$

3. $\log_2 \frac{12}{25}$

4. $\log_2 720$

In Exercises 5–8, expand the logarithmic expression.

5. $\log 10x$

6. $\ln 2x^6$

7. $\log_3 \frac{x^4}{3y^3}$

8. $\ln \sqrt[4]{3y^2}$

In Exercises 9–13, condense the logarithmic expression.

9. $\log_2 3 + \log_2 8$

10. $\log_5 4 - 2\log_5 5$

11. $3\ln 6x + \ln 4y$

12. $\log_2 625 - \log_2 125 + \frac{1}{3}\log_2 27$

13. $-\log_6 6 - \log_6 2y + 2\log_6 3x$

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6.5 Notetaking with Vocabulary (continued)

In Exercises 14–17, use the change-of-base formula to evaluate the logarithm.

14. $\log_3 17$ **15.** $\log_9 294$ **16.** $\log_7 \frac{4}{9}$ **17.** $\log_6 \frac{1}{10}$

18. 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 intensity of the sound of a certain children's television show is half the intensity of the adult show that is on before it. By how many decibels does the loudness decrease?

19. Hick's Law states that given n equally probable choices, such as choices on a menu, the average human's reaction time T (in seconds) required to choose from those choices is approximately $T = a + b \bullet \log_2(n + 1)$ where a and b are constants. If $a = 4$ and $b = 1$, how much longer would it take a customer to choose what to eat from a menu of 40 items than from a menu of 10 items?