Name _____ Date _____ Class_____

Practice B

Properties of Logarithms

Express as a single logarithm. Simplify, if possible.

1. $\log_3 9 + \log_3 27$

2. $\log_2 8 + \log_2 16$

3. $\log_{10} 80 + \log_{10} 125$

_____ _____ _____

4. $\log_6 8 + \log_6 27$

5. $\log_3 6 + \log_3 13.5$

6. $\log_4 32 + \log_4 128$

_____ _____ _____

Express as a single logarithm. Simplify, if possible.

7. $\log_2 80 - \log_2 10$

8. $\log_{10} 4000 - \log_{10} 40$

9. $\log_4 384 - \log_4 6$

_____ _____ _____

10. $\log_2 1920 - \log_2 30$

11. $\log_3 486 - \log_3 2$

12. $\log_6 180 - \log_6 5$

_____ _____ _____

Simplify, if possible.

13. $\log_4 4^6$

14. $\log_5 5^{x-5}$

15. ~~log 230~~

_____ _____ _____

16. ~~log 20~~

17. $\log_8 8^5$

18. $\log_3 9^4$

_____ _____ _____

Evaluate. Round to the nearest hundredth.

19. $\log_{12} 1$

20. $\log_3 30$

21. $\log_5 10$

_____ _____ _____

Solve.

22. The Richter magnitude of an earthquake, M, is related to the energy released in ergs, E, by the formula $M = \frac{2}{3}\log\left(\frac{E}{10^{11.8}}\right)$.

Find the energy released by an earthquake of magnitude 4.2. _____

Holt Algebra 2

LESSON	**Practice C**
7-4	*Properties of Logarithms*

Express as a single logarithm. Simplify, if possible.

1. $\log_6 12 + \log_6 18$

2. $\log_3 81 - \log_3 27$

3. $\log_4 128 - \log_4 8$

_____

4. $\log_6 18 + \log_6 72$

5. $\log_5 3125 - \log_5 25$

6. $\log_8 128 + \log_8 256$

_____

7. $\log_5 5 + \log_5 125$

8. $\log_2 256 - \log_2 64$

9. $\log_3 8019 - \log_3 99$

_____

10. $\log_8 80 + \log_8 51.2$

11. $\log_7 13.3 - \log_7 1.9$

12. $\log_{10} 125 + \log_{10} 80$

_____

Evaluate. Round to the nearest hundredth.

13. $\log_8 8^6$

14. ~~$\log_2 2^{99}$~~

15. $\log_2 16^5$

_____

16. $\log_3 3^{(2x + 1)}$

17. $\log_4 16^{(x-1)}$

18. ~~$\log_6 2^{99}$~~

_____

19. $\log_3 5^2$

20. $\log_5 \left(\dfrac{1}{125}\right)^2$

21. $\log_6 \left(\dfrac{1}{6^4}\right)^3$

_____

22. $\log_4 20^2$

23. $\log_9 27^4$

24. $\log_2 10$

_____

Solve.

25. Carmen has a painting presently valued at \$5000. An art dealer told her the painting would appreciate at a rate of 6% per year. In how many years will the painting be worth \$8,000?

   a. Write a logarithmic expression.

   _____

   b. Simplify your expression.

   _____

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