7.5 HW ~ Evaluate Logarithms & Graph Logarithmic Functions Name Key

(1-4) Match the expression with the logarithm that has the same value

1. ln6 – ln2 (B)
2. 2ln6 (D)
3. 6ln2 (A)
4. Ln6 + ln2 (C)

A) ln64 B) ln3 C) ln12 D) ln36

(5-8) Use $\log 4 \approx 0.602$ **and** $\log 12 \approx 1.079$ **to evaluate the logarithm.**

5. log48 — 1.68
6. log64 — 1.81
7. $\log \frac{1}{3}$ — −0.48
8. $\log \frac{1}{12}$ — −1.08

(9-16) Expand the expression.

9. $\ln 5x$ — $\ln 5 + \ln x$
10. $\log_5 x^5$ — $5 \log_5 x$
11. $\ln \frac{12}{5}$ — $\ln 12 - \ln 5$
12. $\ln 4x^2y$ — $\ln 4 + 2\ln x + \ln y$
13. $\log_6 36x^2$ — $\log_6 36 + 2\log_6 x$
14. $\log 10x^3$ — $\log 10 + 3\log x$
15. $\ln \frac{6x^2}{y^4}$ — $\ln 6 + 2\ln x - 4\ln y$
16. $\log_3 \sqrt{9x}$ — $\frac{1}{2}(\log_3 9 + \log_3 x)$

17. Describe and correct the error in expanding the logarithmic expression:

$$\ln 8x^3 = 3\ln 8 + \ln x$$

The power of 3 is attached to the x, not the 8;

$$\ln 8 + 3\ln x$$

(18-22) Condense the expression

18. $\ln 12 - \ln 4$

$\ln 3$

19. $6\ln x + 4\ln y$

$\ln x^6 y^4$

20. $5\log_4 2 + 7\log_4 x + 4\log_4 y$

$\log_4 32x^7y^4$

21. $\log_5 4 + \frac{1}{3}\log_5 x$

$\log_5 4 \cdot \sqrt[3]{x}$

22. $2(\log_3 20 - \log_3 4) + 0.5\log_3 4$

$\log_3 50$

(23-25) Use the change-of-base formula to evaluate the logarithm

23. $\log_5 13$

24. $\log_8 22$

25. $\log_2 \frac{15}{7}$

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26. The intensity of the sound TV ads make is ten times as great as the intensity for an average TV show. How many decibels louder is the TV ad? Justify your answer using the properties of ~~algorithms~~ logarithms.

10

$L(10I) - L(I)$

$= 10\log\frac{10I}{I_0} - 10\cdot\log\frac{I}{I_0}$ ← similar to example 4 in the notes

$= 10\left(\log\frac{10I}{I_0} - \log\frac{I}{I_0}\right)$

$= 10\left(\log 10 + \log\frac{I}{I_0} - \log\frac{I}{I_0}\right)$

$= 10\cdot\log 10$

$= 10(1) = 10$