

6.2.1 EXERCISES

In Exercises 1 - 15, expand the given logarithm and simplify. Assume when necessary that all quantities represent positive real numbers.

1. $\ln(x^3y^2)$

2. $\log_2 \left(\frac{128}{x^2 + 4} \right)$

3. $\log_5 \left(\frac{z}{25} \right)^3$

4. $\log(1.23 \times 10^{37})$

5. $\ln \left(\frac{\sqrt{z}}{xy} \right)$

6. $\log_5 (x^2 - 25)$

7. $\log_{\sqrt{2}} (4x^3)$

8. $\log_{\frac{1}{3}} (9x(y^3 - 8))$

9. $\log (1000x^3y^5)$

10. $\log_3 \left(\frac{x^2}{81y^4} \right)$

11. $\ln \left(\sqrt[4]{\frac{xy}{ez}} \right)$

12. $\log_6 \left(\frac{216}{x^3y} \right)^4$

13. $\log \left(\frac{100x\sqrt{y}}{\sqrt[3]{10}} \right)$

14. $\log_{\frac{1}{2}} \left(\frac{4\sqrt[3]{x^2}}{y\sqrt{z}} \right)$

15. $\ln \left(\frac{\sqrt[3]{x}}{10\sqrt{yz}} \right)$

In Exercises 16 - 29, use the properties of logarithms to write the expression as a single logarithm.

16. $4\ln(x) + 2\ln(y)$

17. $\log_2(x) + \log_2(y) - \log_2(z)$

18. $\log_3(x) - 2\log_3(y)$

19. $\frac{1}{2}\log_3(x) - 2\log_3(y) - \log_3(z)$

20. $2\ln(x) - 3\ln(y) - 4\ln(z)$

21. $\log(x) - \frac{1}{3}\log(z) + \frac{1}{2}\log(y)$

22. $-\frac{1}{3}\ln(x) - \frac{1}{3}\ln(y) + \frac{1}{3}\ln(z)$

23. $\log_5(x) - 3$

24. $3 - \log(x)$

25. $\log_7(x) + \log_7(x - 3) - 2$

26. $\ln(x) + \frac{1}{2}$

27. $\log_2(x) + \log_4(x)$

28. $\log_2(x) + \log_4(x - 1)$

29. $\log_2(x) + \log_{\frac{1}{2}}(x - 1)$

Evaluating Logarithmic Answer Key

Guillaume Favre



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