

Simplify.

1. $8^{\frac{2}{3}}$
2. $64^{\frac{1}{6}}$
3. $64^{\frac{1}{3}}$
4. $64^{\frac{1}{2}}$
5. $81^{\frac{1}{4}}$
6. $81^{\frac{3}{2}}$
7. $25^{\frac{3}{2}}$
8. 10^0
9. $16^{-\frac{1}{2}}$
10. $27^{-\frac{2}{3}}$
11. $\left(\frac{4}{9}\right)^{-\frac{3}{2}}$
12. $\left[\left(\frac{7}{49}\right)^3\right]^0$
13. $\log_2 8$
14. $\log_8 2$
15. $\log 1000$
16. $\log(.001)$
17. $\log_5 125$
18. $\log_{25} 125$
19. $\log_{125} \left(\frac{1}{5}\right)$
20. $\log_{\frac{1}{25}} 5$
21. $\ln e$
22. $\ln e^2$
23. $\ln 1$
24. $\ln \frac{1}{e^7}$
25. $\log_2 8 + \log_2 2$
26. $\log_7 \frac{1}{343} + \log_7 49$
27. $\log 40 + \log 50 + \log 5$
28. $\log 1 - \log \frac{1}{10}$
29. $\log_6 9 + \log_6 4$
30. $\log_{12} 288 - \log_{12} 2$

Write as a single logarithm

31. $\log_2 3 + \log_2 5 - \log_2 4$

32. $\log_9 x + \log_9 (x - 7)$

33. $\ln x - 2 \ln y + 3 \ln z$

34. $\frac{1}{2} \ln (x + 2) - 7 \ln x$

Write as a single logarithm. Make sure you have like terms.

35. $1 + \log x$

36. $\log (7) - 3$

37. $2 + \log_5 x$

38. $1 + \log_3 4$

39. $1 + \ln z$

40. $\ln (x + 1) + 2$

Write as the sum or difference of logarithms.

41. $\log \frac{10\sqrt{xy^3}}{z^2}$

42. $\ln \frac{s^3 t^{\frac{2}{3}}}{u^2 v}$

Evaluate. Be careful and read everything closely.

43. $\log_2 8 + \log_3 9$

44. $\frac{\log 100}{\ln e^4}$

45. $\log \left(\frac{10^{\frac{2}{3}}}{100^{\frac{1}{2}}} \right)$

46. $\frac{1}{3} \ln 8 + \frac{1}{2} \ln 529$