

1. (a) $2^5 = 32$ (b) $5^0 = 1$
3. (a) $4^{1/2} = 2$ (b) $2^{-4} = \frac{1}{16}$
5. (a) $e^x = 5$ (b) $e^5 = y$
7. (a) $\log_2 8 = 3$ (b) $\log_{10} 0.001 = -3$
9. (a) $\log_4 0.125 = -\frac{3}{2}$ (b) $\log_7 343 = 3$
11. (a) $\ln 2 = x$ (b) $\ln y = 3$
13. (a) $\log_5 5^4 = 4$ (b) $\log_4 64 = \log_4 4^3 = 3$
(c) $\log_9 9 = 1$
15. (a) $\log_8 64 = \log_8 8^2 = 2$ (b) $\log_7 49 = \log_7 7^2 = 2$
(c) $\log_7 7^{10} = 10$
17. (a) $\log_3 \left(\frac{1}{27}\right) = \log_3 3^{-3} = -3$ (b) $\log_{10} \sqrt{10} = \log_{10} 10^{1/2} = \frac{1}{2}$
(c) $\log_5 0.2 = \log_5 \left(\frac{1}{5}\right) = \log_5 5^{-1} = -1$
19. (a) $2^{\log_2 37} = 37$ (b) $3^{\log_3 8} = 8$
(c) $e^{\ln \sqrt{5}} = \sqrt{5}$
21. (a) $\log_8 0.25 = \log_8 8^{-2/3} = -\frac{2}{3}$ (b) $\ln e^4 = 4$
(c) $\ln \left(\frac{1}{e}\right) = \ln e^{-1} = -1$
23. (a) $\log_2 x = 5 \Leftrightarrow x = 2^5 = 32$ (b) $x = \log_2 16 = \log_2 2^4 = 4$
25. (a) $\log_{10} x = 2 \Leftrightarrow x = 10^2 = 100$ (b) $\log_5 x = 2 \Leftrightarrow x = 5^2 = 25$
27. (a) $\log_x 16 = 4 \Leftrightarrow x^4 = 16 \Leftrightarrow x = 2$
(b) $\log_x 8 = \frac{3}{2} \Leftrightarrow x^{3/2} = 8 \Leftrightarrow x = 8^{2/3} = 4$