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$$b^{\log_b x} = x \text{ and } \log_b b^x = x. \tag{2}$$

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- $\log_b(x^r) = r \log_b x$
- $\log_b 1 = 0$.

In other words, The logarithm of a product or quotient is the sum or difference of logarithms and the logarithm of a number to a power is the power times the logarithm of that number.