

[exponential + logarithmic functions]

1. Evaluate

- $625^{0.5}$
- $625^{-0.25}$
- $343^{\frac{1}{3}}$
- $0.343^{-\frac{1}{3}}$

2. Simplify or evaluate where possible

- $27^{\frac{2}{3}} \times 81^{0.75}$
- $(3^2 + 2^4)^{0.5}$
- $1000^{\frac{2}{3}} \div 0.125^{-\frac{2}{3}}$
- $2^{-3} + 5^{-2}$
- $(3^4 - 7^2)2^{-5}$
- $\frac{y^{2.3}}{y^{-5}}$
- $(p^2 q^6)^{\frac{1}{2}}$
- $5^{\frac{1}{3}} \times 5^{\frac{4}{9}} \times 5^{-\frac{5}{18}}$
- $\frac{p^{2a} p^{-3a}}{p^{-5a}}$

3. Solve

- $2^x = 32$
- $2^x = 31$
- $2 \log_5 x = 4$
- $\log_3(5x + 7) - \log_3(x - 1) = \log_3(3x + 2)$
- $\log_a x + 2 \log_a x = \log_a 8$
- $m = \log_3 8$
- $5000 = 2000(1.05)^n$

4. Evaluate

- $4 \log_{\frac{1}{3}} 9\sqrt{27}$
- $\log_4 2^{\sqrt[5]{8}}$
- $\log_2 8\sqrt{32} + \log_7 49^{\sqrt[4]{7}}$

5. Write as a single logarithm

- $\frac{1}{2} \log_5 x + \frac{1}{3} \log_5 y - \frac{1}{4} \log_5 z$
- $2 \log_2 3^2 + \log_2 6 - 3 \log_2 3$