

Logs and exponentials are inverses

$$b^y = x$$

$$\log_b(b^y) = \log_b x$$

$$y = \log_b x$$

$$y = \log_b x$$

$$b^y = b^{\log_b x}$$

$$b^y = x$$

Exponentiate

① To solve for an x in an exponent $\rightarrow$ take logs
 $10^x = 4$

$$\log_{10}(10^x) = \log_{10} 4$$

$$x = 0.60205 \dots$$

$$\ln(10^x) = \ln 4$$

$$x \cdot \ln 10 = \ln 4$$

$$x = \frac{\ln 4}{\ln 10} = 0.602 \dots$$

② To solve for an x inside a log $\rightarrow$ exponentiate

$$\log(x) = 2.8$$

$$10^{\log x} = 10^{2.8}$$

$$x = 10^{2.8}$$

$$= 630.957 \dots$$

by definition ③

