

Exponentials and logarithms


Definition

$$a^x = b \iff x = \log_a b$$

Laws

$$\log_a xy = \log_a x + \log_a y, \quad \log_a \frac{x}{y} = \log_a x - \log_a y,$$

$$\log_a x^k = k \log_a x$$

Change of base **B**

$$\log_a x = \frac{\log_b x}{\log_b a}$$

Exponential form**B**

$$a^x = e^{x \ln a}$$

Inverses

$$e^{\ln x} = x, \quad \ln e^x = x$$

Linearising

$$y = ax^n \Rightarrow \log y = \log a + n \log x;$$

$$y = kb^x \Rightarrow \log y = \log k + x \log b$$

B given in the exam. Learn the rest.