# 3.3 Logarithmic and Exponential Functions

At the end of this outcome I should...                    I can do   Revised

3.3.1   know that $a^y = x \Leftrightarrow \log_a x = y$ $(a > 1, \ x > 0)$          ☐          ☐

3.3.2   know the laws of logarithms

$\log_a 1 = 0, \quad \log_a a = 1$

$\log_a bc = \log_a b + \log_a c$

$\log_a \dfrac{b}{c} = \log_a b - \log_a c$

$\log_a b^n = n \log_a b$          ☐          ☐

3.3.3   simplify numerical expressions using laws of logs          ☐          ☐

3.3.4   solve simple logarithmic and exponential equations

e.g.   $3.4^x = 5$          ☐          ☐

3.3.5   solve for $a$ and $b$ equations of the following forms, given two pairs of corresponding values of $x$ and $y$

$\log y = a \log x + b$

$y = ax^b$

$y = ab^x$          ☐          ☐

3.3.6   use a straight line graph to confirm relationships of the form

$y = ax^b$, also $y = ab^x$          ☐          ☐

3.3.7   model mathematically situations involving the logarithmic or exponential function

**from experimental data draw graph of $\log y$ against $\log x$ and deduce values of $a$ and $b$ such that $y = ax^b$**          ☐          ☐

N.B.   **Bold** type indicates Level A/B content.