Logs & Exponentials

\[ y = \log_a x \]

- To undo log take exponential
- \[ \log_a 1 = 0 \]
- \[ \log_a a = 1 \]

\[ y = a^x \]

- \[ a^0 = 1 \]
- \[ a^1 = a \]

Basic log rules

\[ \log A + \log B = \log AB \]
\[ \log A - \log B = \log \frac{A}{B} \]
\[ \log (A)^n = n \log A \]

Basic log graph

Basic exponential graph

\[ y = ab^x \]

Can be transformed into a graph of the form

\[ \log y = x \log b + \log a \]
\[ Y = mX + C \]
\[ Y = (\log b)X + C \]
\[ C = \log a \quad m = \log b \]

\[ y = ax^b \]

Can be transformed into a graph of the form

\[ \log y = b \log x + \log a \]
\[ Y = mX + C \]
\[ Y = bX + C \]
\[ C = \log a \quad m = b \]