

More About Logs

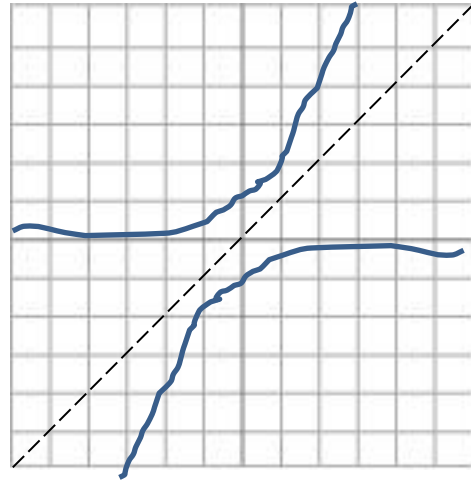
Graphs of logs

What does the graph of a logarithm look like:

Exponential function: $y = 2^x$

Logarithmic function: $y = \log_2 x$

Inverse functions are symmetric about the line $y = x$



Important Logarithms

1. Log base 10 $\rightarrow \log_{10}$ is called the **common log**.

It is usually written without the base: $\log_{10} x = \log x$

e = Euler's number = 2.71828...

2. Log base e $\rightarrow \log_e$ is called the **natural log**.

It is usually written as ln: $\log_e x = \ln x$

Evaluating logs with a calculator

Ex: $\log_{10} 9 = \log 9 = \boxed{\text{Log}} \boxed{9} = 0.9542$

Ex: $\log_e 9 = \ln 9 = \boxed{\text{Ln}} \boxed{9} = 2.197$

Ex: $\log_7 9 = ??$

Change of Base Formula

To find the value of a logarithm that has a base other than 10 or e, use the following:

Change of Base Formula: $\log_b a = \frac{\log a}{\log b}$

Ex: $\log_7 9 = \frac{\log 9}{\log 7} = \frac{0.9542}{0.8451} = 1.129$

Ex: Solve for x: $100 = 7^x \rightarrow x = \log_7 100 = \frac{\log 100}{\log 7} = \frac{2}{0.8451} = 2.367$