

Exponential and Logarithmic Functions

Graphs

passes through (0,1) and (1,a) $y = a^x$

passes through (1,0) and (a,1) $y = \log_a x$

Log Graphs

straight line
find y in terms of x
log y against log x

$y = kx^n$
k and n found from graph

find y in terms of x
log y against x

$y = ab^x$
a and b found from graph

Logs

Laws

- $\log x + \log y = \log xy$
- $\log x - \log y = \log \frac{x}{y}$
- $\log x = n \log x^n$
- $\log 1 = 0$
- $\log a = 1$

On the calculator

- log to base e natural log ln button
- log to base 10 log button

Equations

- x is a power
eg $4^x = 10$
take logs of both sides
use log laws
- how to solve
each side has a log
cancel logs
or logs on one side, numbers on other
rewrite in power form