Logs & Exponentials

Exponential and Logarithmic Functions

- Graphs
  - passes through (0,1) and (1,0) \( y = a \)
  - passes through (1,0) and (a,1) \( y = \log x \)

Logs

- Laws
  - \( \log x \times \log y = \log xy \)
  - \( \log x - \log y = \log x/y \)
  - \( \log x^n = n \log x \)
  - \( \log_a 1 = 0 \)
  - \( \log_a a = 1 \)

- On the calculator
  - log to base e
  - log to base 10
  - \( \ln \) button

- Equations
  - \( x \) is a power
  - eg 4 = 10
  - take logs of both sides
  - use log laws
  - cancel logs
  - each side has a log
  - on logs on one side, numbers on other
  - rewrite power form

- Find y in terms of x
  - straight line
  - log y against log x
  - log y against x

- k and n found from graph
  - a and b found from graph

- find y in terms of x
  - log y against log x
  - log y against x