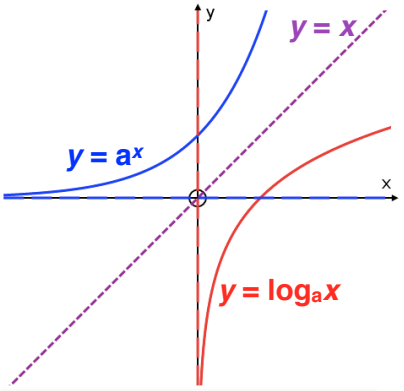
Graphs of Logarithms

Starter

1. **(Review of last lesson)** Find the gradient of the curve $y = 5e^{0.5x}$ at the points:
   (a) $x = -2$ (b) $x = 2$.
   Leave your answers in exact form.

Notes

The function $y = \log_a x$ is the ***inverse*** of the function $y = a^x$.



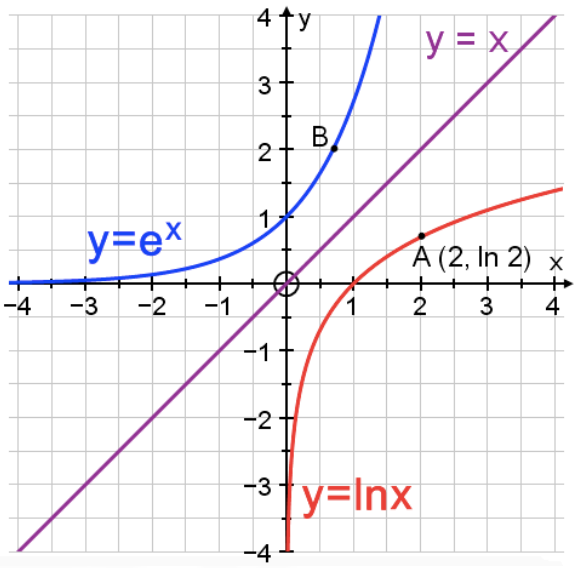
Inverse functions will be looked at more closely in the A2 course.

The graph of $y = \log_a x$ is asymptotic to the $y-$axis
i.e. the curve gets closer and closer to $y-$axis but never actually touches it.

Graphically, this means that the graph of $y = \log_a x$ is the reflection of the graph of $y = a^x$ in the line $y = x$.

E.g. 1 The graph of $y = \ln x$ is a reflection of the graph of $y = e^x$ in the line $y = x$
Point A has coordinates $(2,\ \ln 2)$ and B is at the reflection of A.

(a) Write down the coordinates of B.
(b) State the gradient of $y = e^x$ at B.
(c) Hence, write down the gradient of $y = \ln x$ at A.
(d) Generalise your result from (c).



Video: Transformations of exponential graphs

Solutions to Starter and E.g.s

Exercise

No exercise

Summary

The function $y = \log_a x$ is the ***inverse*** of the function $y = a^x$.
The graph of $y = \log_a x$ is asymptotic to the $y-$axis
The graph of $y = \log_a x$ is the reflection of the graph of $y = a^x$ in the line $y = x$