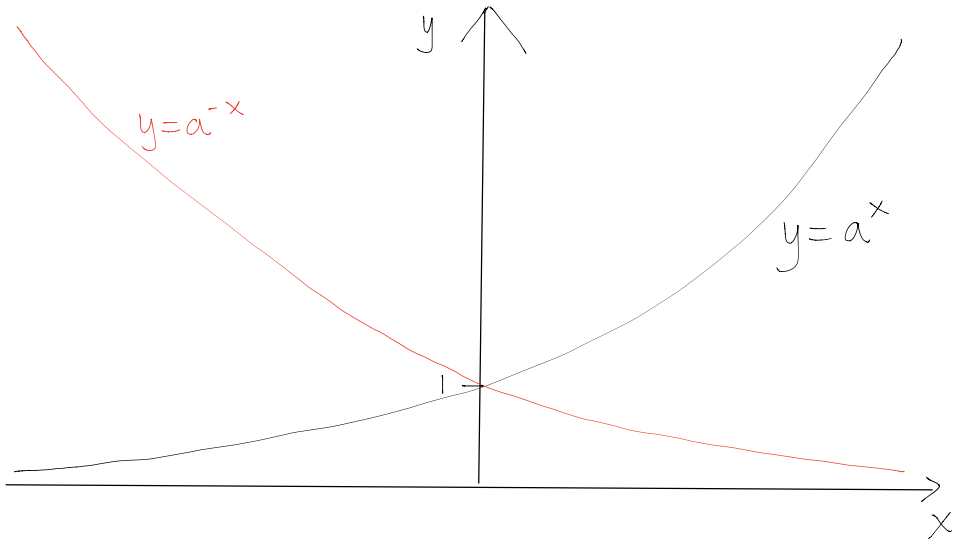
C2 - Chapter 3 - Exponentials and logarithms

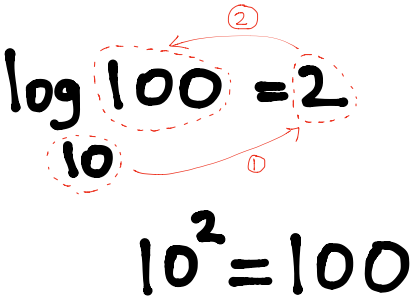


Important features of the graph of $y=a^x$ $(a>0)$

- Graph cuts the y-axis at (0,1)
- $y=0$ is a horizontal asymptote (ie the curve never touches or goes below it)
- $y>0$ for all values of x

LAWS OF LOGARITHMS

* $\log 1 = 0$
* $\log_a a = 1$ for all values of a
* $\log_a xy = \log x + \log y$
* $\log_a (x/y) = \log x - \log y$
* $\log_a x^k = k \log x$
* $\log_a \left(\frac{1}{x}\right) = -\log x$



* In the exam you would be expected to be able to solve exponential equations (ie equations where x appears as a power) and logarithmic equations. With logarithmic equations try to express everything as a single logarithm and then proceed.
Avoid using the rules of logarithms wrongly, as shown in the examples below

$\log(9-2x) = \log 9 - \log 2x$ ✗

$3^{2x} + 3^x = 2$
$\log 3^{2x} + \log 3^x = \log 2$ ✗