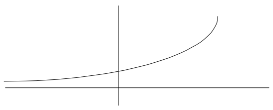
UCONN- Math 1011Q

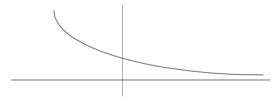
Exponential and Logarithmic Functions

☺ **Exponential Function $y = b^x$ (for $0 < b \neq 1$ fixed number)**



$y = b^x$

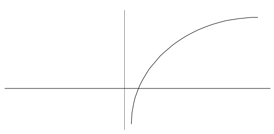
for $b > 1$ **for $b < 1$**



Equality of exponents : $b^x = b^z$ is equivalent to $x = z$

☺ **Logarithmic Functions $y = \log_b x$ (for $0 < b \neq 1$ fixed number) :**

$y = \log_b x$ means $b^y = x$



$y = \log_b x$ for $b > 1$

Equality of logs: $\log_b x = \log_b z$ is equivalent to $x = z$

$\ln x = \log_e x$ where $e \approx 2.7$, $\log x = \log_{10} x$, $\log_b 1 = 0$, $\log_b b = 1$

The three rules of log:

Product Rule: $\log_b xy = \log_b x + \log_b y$

Quotient Rule: $\log_b \frac{x}{y} = \log_b x - \log_b y$

Power Rule: $\log_b x^r = r\log_b x$

Cancellations:

$\log_b b^x = x$ and $b^{\log_b x} = x$

Memory peg: $\log_b b^{CAT} = CAT$ and $b^{\log_b DOG} = DOG$