Basic Properties of Logarithms

Consider the expressions i) \(2^{\log_2{32}}\) and ii) \(\log_2{2^5}\).

i) \(2^{\log_2{32}} = 2^5 = 32\)

ii) \(\log_2{2^5} = \log_2{32} = 5\)

You can use the definition of logarithm to develop these two simple properties of logs.

If \(x > 0\), and \(b > 0\), \(b \neq 1\),

then \(y = \log_b{x}\) if and only if \(b^y = x\).

\[b^{\log_b{u}} = u\] since \(\log_b{u} = \log_b{u}\).

\[\log_b{b^u} = u\] since \(b^u = b^u\)

Also we have:
\[\log_b{b} = 1\]
\[\log_b{1} = 0\].