

## Writing an Expression as a Logarithm

$\log_a n = x$  means  $a^x = n$  where  $a$  is called the base of the logarithm

We use this fact to write an equation as a logarithm so that we can solve it.

*Example 1.*  $\log_{10} 100 = 2$   
 $10^2 = 100$

*Example 2.*  $2^5 = 32$   
 $\text{Log}_2 32 = 5$

*Example 3.* Find the value of  $\text{Log}_3 81$   
 $\log_3 81 = x$   
 $3^x = 81$   
 $x = 4$  as  $3^4 = 81$

*Example 4.* Find the value of  $x$  if  $\text{Log}_x 64 = 3$   
 $\text{Log}_x 64 = 3$   
 $x^3 = 64$   
 $x = 4$  as  $4^3 = 64$

*Example 5.* Solve  $\text{Log}_2 x = 3.5$   
 $\text{Log}_2 x = 3.5$   
 $2^{3.5} = x$   
 $x = 11.3$  (1dp)

