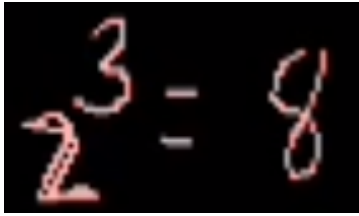
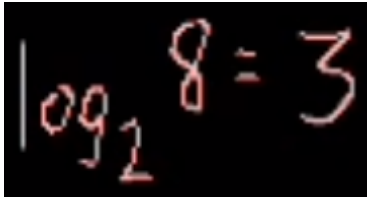


## INTRODUCTION:

If we say “2 to the 3<sup>rd</sup> power equals 8”....

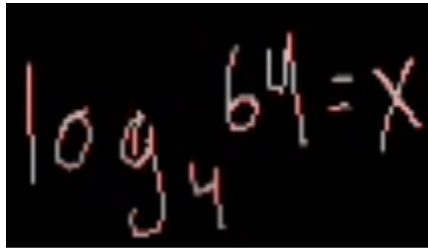

$$2^3 = 8$$

... we are saying that “log base 2 of 8 is equal to 3”:

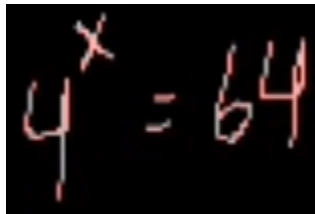

$$\log_2 8 = 3$$

... so 2 to the what power equals 8?... it is 3.

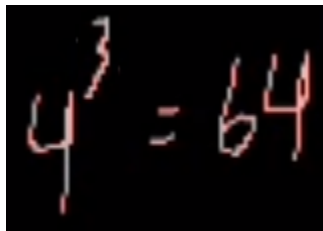
If we say log base 4 of 64 is equal to x...

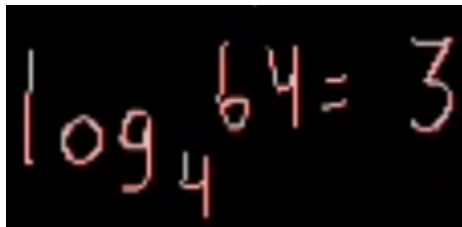

$$\log_4 64 = x$$

... we can rewrite it as 4 to the x power equals 64:


$$4^x = 64$$

... so 4 to the power of 3 equals 64:

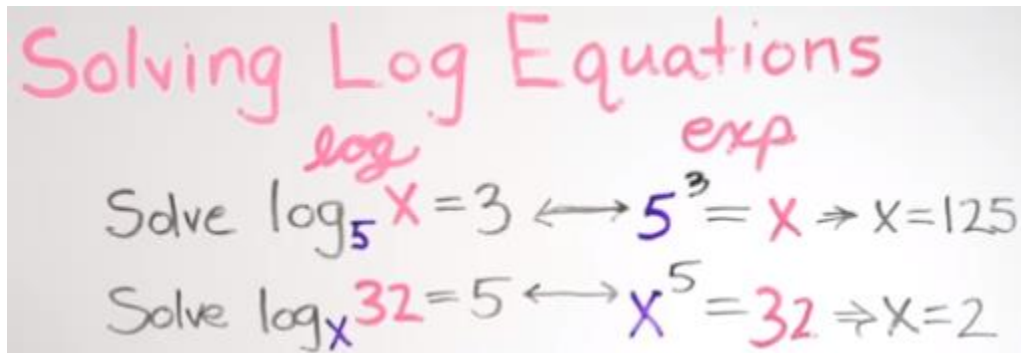

$$4^3 = 64$$


$$\log_4 64 = 3$$

...thus, log base 4 of 64 is equal to 3.

## EVALUATING LOGARITHMIC EQUATIONS:

To better understand Logarithms, we can write them as reverse equations of exponential equations:



The image shows handwritten notes on a light background. At the top, the title "Solving Log Equations" is written in pink. Below it, two examples are shown. The first example is "Solve  $\log_5 X = 3$ " with "log" written above the log symbol and "X" in pink. This is followed by a double-headed arrow and the exponential equation " $5^3 = X$ " with "exp" written above the 5 and "X" in pink, leading to " $\Rightarrow X = 125$ ". The second example is "Solve  $\log_X 32 = 5$ " with "X" in blue and "32" in pink. This is followed by a double-headed arrow and the exponential equation " $X^5 = 32$ " with "X" in blue and "32" in pink, leading to " $\Rightarrow X = 2$ ".

Solving Log Equations

Solve  $\log_5 X = 3 \leftrightarrow 5^3 = X \Rightarrow X = 125$

Solve  $\log_X 32 = 5 \leftrightarrow X^5 = 32 \Rightarrow X = 2$