

# LOGARITHMS WORKSHEET #1 (YR12 ADV)

## INTRODUCTION TO LOGARITHMS

### NOTES:

Logarithm is another name for the index or power of another number, these are related exponential functions.

$$\text{If } y = a^x, \text{ then } x = \log_a y$$

### Example

1. Evaluate  $\log_3 81$

*Solution*

$$\begin{aligned} \text{Let } \log_3 81 &= x \\ 3^x &= 81 \\ &= 3^4 \\ \therefore x &= 4 \end{aligned}$$

2. Find the value of  $\log_2 \frac{1}{8}$

*Solution*

$$\begin{aligned} \text{Let } \log_2 \frac{1}{8} &= x \\ 2^x &= \frac{1}{8} \\ &= 2^{-3} \\ \therefore x &= -3 \end{aligned}$$

### Skills:

1. Evaluate

a)  $\log_4 16 =$

b)  $\log_5 1 =$

c)  $\log_2 128 =$

d)  $\log_2 \frac{1}{2} =$

e)  $\log_7 \sqrt[4]{7} =$

f)  $\log_2 \frac{\sqrt{2}}{4} =$

### Applications:

1. Evaluate  $y$  given that  $\log_y 125 = 3$

2. Sketch the graph of  $y = \log_e x$ . What is its domain and range?