



Air maths tuition

Interact, engage and perform

Rules for Logarithms you need to know

$$\log_a N = x \Leftrightarrow a^x = N$$

$$\log_a a = 1 \text{ since } a^1 = a$$

$$\log_a 1 = 0 \text{ since } a^0 = 1$$

Multiplication Rule

$$\log_a xy = \log_a x + \log_a y$$

Division Rule

$$\log_a \frac{x}{y} = \log_a x - \log_a y$$

Power Rule

$$\log_a x^n = n \log_a x$$

Simplify

$$1) \log_3 4 + \log_3 5 = \log_3 20$$

$$2) \log_2 72 - \log_2 9 = \log_2 \frac{72}{9} \\ = \log_2 8 \\ = 3$$

$$3) 2 \log 5 + \log 4 = \log 5^2 + \log 4 \\ = \log (25 \times 4) \\ = \log 100 = 2$$

Expand

$$4) \log \frac{x^3 y^2}{z} = \log x^3 + \log y^2 - \log z \\ = 3 \log x + 2 \log y - \log z$$

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