



# Core Mathematics C12(GCE)

Practice Answer 9

Standard A★

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**CRITICAL THINKING IS THE KEY TO SOLVE REAL WORLD PROBLEMS.  
CHILDREN MUST BE TAUGHT HOW TO THINK, NOT WHAT TO THINK.  
A GREAT TEACHER WILL BE CREATING STUDENTS TO DO NEW THINGS  
THROUGH CRITICAL THINKING, NOT SIMPLY REPEATING WHAT OTHER  
GENERATIONS HAVE DONE BEFORE. WE DO NOT NEED ANOTHER  
ALBERT EINSTEIN OR ISAAC NEWTON.... WE NEED A PERSON BETTER  
THAN THEM.**

**MR.S.V. SWARNARAJA**

**Answer:**

**Method 1**

$$a = \log_6 12 = \frac{\log_2 12}{\log_2 6} = \frac{\log_2 4 + \log_2 3}{\log_2 2 + \log_2 3} = \frac{2 + \log_2 3}{1 + \log_2 3} \rightarrow \textcircled{1}$$

$$b = \frac{\log_2 81}{\log_2 16} = \frac{4 \log_2 3}{4} = \log_2 3$$

Substitute,  $b = \log_2 3$  in  $\textcircled{1}$

$$a = \frac{2+b}{1+b}$$

Therefore,  $a(1 + b) = 2 + b$

**Answer:**

## Method 2

$$a(1 + b) = \log_6 12(1 + \log_{16} 81)$$

$$= \frac{\log_2 12}{\log_2 6} \left( 1 + \frac{\log_2 81}{\log_2 16} \right)$$

$$= \left( \frac{\log_2 4 + \log_2 3}{\log_2 2 + \log_2 3} \right) \left( 1 + \frac{4 \log_2 3}{4} \right)$$

$$= \left( \frac{2 + \log_2 3}{1 + \log_2 3} \right) \times (1 + \log_2 3)$$

$$= 2 + \log_2 3$$

$$= 2 + b$$

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# Golden Rules

- $\log_a(xy) = \log_a x + \log_a y$
- $\log_a\left(\frac{x}{y}\right) = \log_a x - \log_a y$
- $\log_a x^m = m \log_a x$
- $\log_a x = \frac{1}{\log_x a}$
- $\log_b a = \frac{\log_c a}{\log_c b}$
- $\log_a 1 = 0$
- $\log_a a = 1$
- $\log_b a = c \Leftrightarrow a = b^c$

*Traditional or Online classes*

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