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SEQUENCES & SERIES (Q 4 & 5, PAPER 1)

LESSON NO. 8: SOME EXTRA ALGEBRA

2006

5 (c) (i) Given two real numbers a and b, where $a > 1$ and $b > 1$, prove that

$$\frac{1}{\log_b a} + \frac{1}{\log_a b} \geq 2.$$

(ii) Under what condition is $\frac{1}{\log_b a} + \frac{1}{\log_a b} = 2.$

2005

5 (a) Solve for x: $\sqrt{10 - x} = 4 - x.$

2003

5 (a) Solve for x: $x = \sqrt{7x - 6} + 2.$

2005

5 (c) (i) Show that $\frac{1}{\log_a b} = \log_b a,$ where $a, b > 0$ and $a, b \neq 1.$

(ii) Show that $\frac{1}{\log_2 c} + \frac{1}{\log_3 c} + \frac{1}{\log_4 c} + \ldots\ldots + \frac{1}{\log_r c} = \frac{1}{\log_{r!} c},$ where $c > 0, c \neq 1.$

2004

5 (b) (ii) Solve $\log_4 x - \log_4 (x - 2) = \frac{1}{2}.$

2002

5 (a) Find the value of x in each case:

(i) $\frac{8}{2^x} = 32$

(ii) $\log_9 x = \frac{3}{2}.$

2001

5 (b) (i) Solve $\log_6 (x + 5) = 2 - \log_6 x$ for $x > 0.$

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ANSWERS

2006 5 (c) $a = b$

2005 5 (a) $x = 1$

2003 5 (a) $x = 10$

2004 5 (b) (ii) $x = 4$

2002 5 (a) (i) $x = -2$ (ii) $x = 27$

2001 5 (b) (i) $x = 4$