6 MUST KNOW QUESTIONS TO CONQUER

LOGARITHM

1	Given that $log_2, a = b$, express **(i)** a in terms of b, **(ii)** $log_2\left(\frac{a^4}{32}\right)$ in terms of b, **(iii)** $\left(\frac{1}{8}\right)^b$ in terms of a. Ans: (i) $a = 2^b$, (ii) $4b - 5$, (iii) $\frac{1}{a^3}$
2	Given that $\log_x 2 = p$ and $\log_4 y = q$, express the following in terms of p and/or q. **(i)** $\log_4 \frac{4x}{y}$, **(ii)** xy. Ans: (i) $1 + \frac{1}{2p} - q$ (ii) $2^{\frac{1}{p}+2q}$
3	Solve the following equations **(i)** $\lg(1-x) - \lg(x+3) = 2\lg 3$, **(ii)** $2\log_x 2 = 3 + \log_2 x^2$. Ans: (i) $x = -2\frac{3}{5}$ (ii) $x = \sqrt{2}$ or $x = \frac{1}{4}$
4	Solve the equation **(i)** $\lg(x-3) + 3\lg 2 = 1 + \lg\left(\frac{1}{5}x\right)$, **(ii)** $4\log_6 x - 2\log_x 6 = 7$. Ans: (i) $x = 4$, (ii) $x = 36$
5	Solve, for x and y, the simultaneous equations $\frac{5^{2x}}{5^{3y}} = \frac{5}{5^3(5^y)}$ $\log_3(x-4) = \log_3(y-1) - \log_3 x$. Ans: $x = 0$ (reject), $x = 5$ or $y = 6$
6	The graph of $y = \log_a x$ passes through the points with coordinates $(27, 3), (1, b)$ and $(c, -1)$. Determine the value of each of the constants a, b and c. Ans: $a = 3, b = 0, c = \frac{1}{3}$