

Name:.....Serial#:.....Sec #:.....

Q.1: Write the expression as a single logarithm with base 3 and simplify

$$2 + 3 \log_{\frac{1}{27}} (x^2 y^3) + 2 \log_{\sqrt[3]{9}} \sqrt[3]{x^4 y^4}$$

Q.2: Find the solution of the equation $\log_3 (\log_2 (\log_5 x^2)) = 0$ **Q.3:** Write True or False:

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

(2) $\log_b a > 0$ if $a > 1$ and $0 < b < 1$

(3) $\log_a x = \frac{1}{\log_b a \cdot \log_x b}$