

**Materi : Logaritma Matematika**

Sifat-sifat Logaritma

Jika  $a^n = x$ , untuk  $a > 0$  dan  $a \neq 1$ , maka  $n = {}^a \log x$

$$a^{a \log x} = x$$

$${}^a \log a^n = n$$

$${}^p \log (a \cdot b) = {}^p \log a + {}^p \log b$$

$${}^p \log \frac{a}{b} = {}^p \log a - {}^p \log b$$

$${}^p \log a^n = n \cdot {}^p \log a$$

$${}^p \log a \times {}^a \log b = {}^p \log b$$

$${}^p \log a = \frac{q \log a}{q \log p}$$

$${}^p \log a = p^n \log a^n$$

$${}^p \log 1 = 0 \rightarrow p^0 = 1$$

$${}^p \log p = 1 \rightarrow p^1 = p$$

$${}^a \log x = {}^a \log y \quad ; x = y$$

$$a^n \log x^m = a_{\log x} \frac{m}{n} = \frac{m}{n} x^a \log x$$

$${}^a \log \frac{1}{b} = - {}^a \log b \rightarrow {}^a \log \frac{1}{b} = {}^a \log b^{-1}$$

$${}^a \log \frac{b}{c} = - {}^a \log \frac{c}{b} \rightarrow {}^a \log \frac{b}{c} = {}^a \log \left( \frac{c}{b} \right)^{-1}$$

Contoh :

Jika  ${}^4 \log 3 = a$ , tentukan nilai  ${}^{16} \log 27$

Penyelesaian :

$$\begin{aligned} {}^{16} \log 27 &= 4^2 \log_3 3^3 \\ &= \frac{3}{2} \times 4 \log 3 \\ &= \frac{3}{2} a \end{aligned}$$

Contoh :

Jika  ${}^3 \log 2 = p$ , hitunglah  ${}^3 \log 32 \sqrt{2}$

Penyelesaian :

$$\begin{aligned} {}^3 \log 32 \sqrt{2} &= 3_{\log 2} 5^{\frac{1}{2}} \\ &= \frac{5}{2} \times 3_{\log 2} = \frac{5}{2} p \end{aligned}$$