

$$a > 0, a \neq 1, b > 0$$

$$a^{\log_a b} = b$$

$$\log_a 1 = 0$$

$$\log_a a = 1$$

$$\log_a(xy) = \log_a x + \log_a y$$

$$\log_a \frac{x}{y} = \log_a x - \log_a y$$

$$\log_a x^p = p \log_a x$$

$$\log_{a^p} x = \frac{1}{p} \log_a x$$

$$\log_a b = \frac{1}{\log_b a}$$

$$\log_a x = \frac{\log_m x}{\log_m a}$$