

$$\frac{1.111}{23} \quad a = \log_{12} 3 = \frac{1}{\log_3 12} = \frac{1}{\log_3 3 + \log_3 4} = \frac{1}{1 + 2\log_3 2} \quad \text{!} \frac{1}{23}$$

$$\checkmark \text{ vs } \quad 1 + 2\log_3 2 = \frac{1}{a} \rightarrow 2\log_3 2 = \frac{1}{a} - 1 = \frac{1-a}{a} \rightarrow \log_3 2 = \frac{1-a}{2a}$$

$$\log_{\sqrt{3}} 8 = \frac{3}{\frac{1}{2}} \log_3 2 = 6 \log_3 2 = 6 \left(\frac{1-a}{2a} \right) = \frac{6}{2a} - \frac{6a}{2a} = \frac{3}{a} - 3$$