

Calculate:

$$3^{\log_3 27} + \log_{\frac{1}{3}} 9 - \sqrt{3}^{\log_3 16} =$$

$$3^{\frac{3}{2}} + (-2) - \sqrt{3}^{\log_3 16} =$$

$$(3^{\frac{1}{2}})^3 - 2 - 4 =$$

$$\sqrt{3}^3 - 6 = 3\sqrt{3} - 6.$$

$$\log_3 27 = \log_3 3^3 = 3\log_3 3$$

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

$$\log_3 3 = \frac{1}{2} \rightarrow 3^{\frac{1}{2}} = 3$$

$$3\log_3 3 = 3 \cdot \frac{1}{2} = \frac{3}{2}$$

$$\log_{\frac{1}{3}} 9 = -2 \rightarrow \left(\frac{1}{3}\right)^{-2} = 9$$

$$\sqrt{3} = 3^{\frac{1}{2}} \rightarrow (3^{\frac{1}{2}})^{\log_3 16} =$$

$$3^{\frac{1}{2} \log_3 16} = 3^{\log_3 16^{\frac{1}{2}}} = 3^{\log_3 4} = 4$$

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

Is that clear?