

$$\sqrt{n} \cdot \frac{\left(\frac{9}{\sqrt{3}}\right)^{\log_3 n + 1} - 1}{\frac{9}{\sqrt{3}} - 1} = \frac{\sqrt{n}}{\frac{9}{\sqrt{3}} - 1} \cdot \left(\frac{9}{\sqrt{3}} \cdot \left(\frac{9}{\sqrt{3}}\right)^{\log_3 n} - 1\right)$$

$$= \frac{\sqrt{n}}{\frac{9}{\sqrt{3}} - 1} \cdot \left(\frac{9}{\sqrt{3}} \cdot n^{\log_3 \frac{9}{\sqrt{3}}} - 1\right) = \frac{\sqrt{n}}{\frac{9}{\sqrt{3}} - 1} \cdot \left(\frac{9}{\sqrt{3}} \cdot n^{\log_3 9 - \log_3 \sqrt{3}} - 1\right)$$

$$= \frac{\sqrt{n}}{\frac{9}{\sqrt{3}} - 1} \cdot \left(\frac{9}{\sqrt{3}} \cdot n^{2 - \frac{1}{2}} - 1\right) = \frac{\frac{9}{\sqrt{3}} \cdot n^2}{\frac{9}{\sqrt{3}} - 1} - \frac{\sqrt{n}}{\frac{9}{\sqrt{3}} - 1} \in O(n^2)$$