

$$a) \sqrt[3]{\sqrt{7}} = \left(7^{\frac{1}{2}}\right)^{\frac{1}{3}} = 7^{\frac{1}{2} \cdot \frac{1}{3}} = 7^{\frac{1}{6}} = \sqrt[6]{7}$$

$$\begin{aligned} b) \sqrt[3]{2^{18} \cdot 5^{12} \cdot 3^3} &= \left(2^{18} \cdot 5^{12} \cdot 3^3\right)^{\frac{1}{3}} \\ &= \left(2^{18}\right)^{\frac{1}{3}} \cdot \left(5^{12}\right)^{\frac{1}{3}} \cdot \left(3^3\right)^{\frac{1}{3}} \\ &= 2^{\frac{18}{3}} \cdot 5^{\frac{12}{3}} \cdot 3^{\frac{3}{3}} \\ &= 2^6 \cdot 5^4 \cdot 3^1 \\ &= 2^6 \cdot 5^4 \cdot 3 \end{aligned}$$

$$\begin{aligned} c) \sqrt[4]{64} \cdot \sqrt[4]{4} &= \left(64\right)^{\frac{1}{4}} \cdot 4^{\frac{1}{4}} \\ \sqrt[4]{64 \cdot 4} &= \left(2^6\right)^{\frac{1}{4}} \cdot \left(2^2\right)^{\frac{1}{4}} \\ \sqrt[4]{256} &= 2^{\frac{6}{4}} \cdot 2^{\frac{2}{4}} = 2^{\frac{3}{2}} \cdot 2^{\frac{1}{2}} \\ &= 2^{\frac{4}{2}} = 2^2 = 4 \end{aligned}$$

$$d) \sqrt[5]{3^{15}} = 3^{\frac{15}{5}} = 3^3 = 27$$

$$\begin{aligned} f) \sqrt{3\sqrt{3}} &= \left(3 \cdot 3^{\frac{1}{2}}\right)^{\frac{1}{2}} = \left(3^{\frac{2}{2}} \cdot 3^{\frac{1}{2}}\right)^{\frac{1}{2}} \\ &= \left(3^{\frac{3}{2}}\right)^{\frac{1}{2}} = 3^{\frac{3}{4}} = \sqrt[4]{3^3} = \sqrt[4]{27} \end{aligned}$$