

Rational Exponents and Roots

(fractions)

$$X^{\frac{m}{n}} = \sqrt[n]{X^m} = \sqrt[n]{X^m}$$

$$Y^{\frac{3}{4}} = \sqrt[4]{Y^3} \quad \sqrt{z^7} = z^{\frac{7}{2}}$$

$$a) \sqrt[3]{243} = \sqrt[3]{3^3 \cdot 9}$$

$$\sqrt[3]{3^3} \cdot \sqrt[3]{9}$$

$$3^{\frac{3}{3}}$$

$$= \boxed{3 \sqrt[3]{9}}$$

$$= 3 \sqrt[3]{3^2}$$

$$15) (125a)^{2/3} = 125^{2/3} a^{2/3}$$

$$\begin{array}{cc} \sqrt[3]{125^2} & \sqrt[3]{a^2} \\ 25 & \sqrt[3]{a^2} \end{array}$$

$$24) \sqrt[4]{256b^5} = 256^{\frac{1}{4}} b^{\frac{5}{4}}$$

$$\sqrt[4]{256} \sqrt[4]{b^5}$$

$$4b^{\frac{5}{4}}$$