

Exercise 2.3

Q.1 Write each radical expression in exponential notation and each exponential expression in radical notation. Do not simplify.

(i) $\sqrt[3]{-64}$

$$= (-64)^{\frac{1}{3}}$$

(ii) $2^{\frac{3}{5}}$

$$= \sqrt[5]{2^3}$$

(iii) $-7^{\frac{1}{3}}$

$$= -\sqrt[3]{7}$$

(iv) $y^{\frac{2}{3}}$

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

Q.2 Tell whether the following statements are true or false?

(i) $5^{\frac{1}{5}} = \sqrt{5}$

False

(ii) $2^{\frac{2}{3}} = \sqrt[3]{4}$

True

(iii) $\sqrt{49} = \sqrt{7}$

False

(iv) $\sqrt[3]{x^{27}} = x^3$

False

Q.3 Simplify the following radical expression.

(i) $\sqrt[3]{-125}$

Solution:

$$= \sqrt[3]{-125}$$

$$= \sqrt[3]{-5 \times -5 \times -5}$$

$$= \sqrt[3]{(-5)^3}$$

$$= -5 \text{ Ans}$$

(ii) $\sqrt[4]{32}$

Solution:

$$\begin{aligned} &= \sqrt[4]{32} \\ &= \sqrt[4]{2 \times 2 \times 2 \times 2 \times 2} \\ &= \sqrt[4]{2^4 \times 2} \\ &= \sqrt[4]{2^4} \times \sqrt[4]{2} \\ &= 2\sqrt[4]{2} \text{ Ans} \end{aligned}$$

(iii) $\sqrt[5]{\frac{3}{32}}$

Solution:

$$\begin{aligned} &= \sqrt[5]{\frac{3}{32}} \\ &= \frac{\sqrt[5]{3}}{\sqrt[5]{32}} \\ &= \frac{\sqrt[5]{3}}{\sqrt[5]{2 \times 2 \times 2 \times 2 \times 2}} \\ &= \frac{\sqrt[5]{3}}{\sqrt[5]{(2)^5}} \\ &= \frac{\sqrt[5]{3}}{2} \text{ Ans} \end{aligned}$$

(iv) $\sqrt[3]{-\frac{8}{27}}$

Solution:

$$\begin{aligned} &= \sqrt[3]{-\frac{8}{27}} \\ &= \sqrt[3]{\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)\left(-\frac{2}{3}\right)} \\ &= \sqrt[3]{\left(-\frac{2}{3}\right)^3} \\ &= -\frac{2}{3} \text{ Ans} \end{aligned}$$