STD – 9 MATHS

CHAPTER - 1

NUMBER SYSTEM

EXERCISE - 1.6

1. Find

(i) $64^{\frac{1}{2}}$

Solution

$$64^{\frac{1}{2}} = (8 \times 8)^{\frac{1}{2}}$$

$$= (8^2)^{\frac{1}{2}}$$

$$= 8^1 \left(2 \times \frac{1}{2} = \frac{2}{2} = 1\right)$$

$$= 8$$

(ii) $32^{\frac{1}{5}}$

Solution

$32^{\frac{1}{5}} = (2^5)^{\frac{1}{5}}$

$= (2^5)^{\frac{1}{5}}$

$= 2^1 \ (5 \times \frac{1}{2} = 1)$

$= 2$

(iii) $125^{\frac{1}{3}}$

Solution

$$125^{\frac{1}{3}} = (5 \times 5 \times 5)^{\frac{1}{3}}$$

$$= (5^3)^{\frac{1}{3}}$$

$$= 5^1 \left(3 \times \frac{1}{3} = \frac{3}{3} = 1\right)$$

$$= 5$$

2. Find

(i) $9^{\frac{3}{2}}$

Solution

$9^{\frac{3}{2}} = (3 \times 3)^{\frac{3}{2}}$

$= (3^2)^{\frac{3}{2}}$

$= 3^3 \left[2 \times \frac{3}{2} = 3\right]$

$= 27$

(ii) $32^{\frac{2}{5}}$

Solution

$$32^{\frac{2}{5}} = (2 \times 2 \times 2 \times 2 \times 2)^{\frac{2}{5}}$$

$$= (2^5)^{\frac{2}{5}}$$

$$= 2^2 \left[5 \times \frac{2}{5} = 2\right]$$

$$= 4$$

(iii) $16^{\frac{3}{4}}$

Solution

$$16^{\frac{3}{4}} = (2 \times 2 \times 2 \times 2)^{\frac{3}{4}}$$

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

$$= 2^3 \left[4 \times \frac{3}{4} = 3\right]$$

$$= 8$$

(iv) $125^{-\frac{1}{3}}$

Solution

$$125^{-\frac{1}{3}} = (5 \times 5 \times 5)^{-\frac{1}{3}}$$

$$= (5^3)^{-\frac{1}{3}}$$

$$= 5^{-1} \left[3 \times -\frac{1}{3} = -1\right]$$

$$= \frac{1}{3}$$

3. Simplify :

(i) $2^{\frac{2}{3}} \times 2^{\frac{1}{5}}$

Solution

$= 2^{\frac{2}{3}} \times 2^{\frac{1}{5}}$

$= 2^{\frac{2}{3}+\frac{1}{5}}$ [since, $a^m \times a^n = a^{m+n}$ laws of exponents]

$= 2^{\frac{13}{15}}$ $\left[\frac{2}{3}+\frac{1}{5}=\frac{(2\times5+3\times1)}{3\times5}=\frac{13}{15}\right]$

(ii) $\left(\frac{1}{3^3}\right)^7$

Solution

$= \left(\frac{1}{3^3}\right)^7$

$= (3^{-3})^7$ [since, $(a^m)^n = a^{m \times n}$ laws of exponents]

$= 3^{-27}$

(iii) $\frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}}$

Solution

$$\frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}} = 11^{\frac{1}{2}-\frac{1}{4}}$$

$$= 11^{\frac{1}{4}} \qquad \left[\left(\frac{1}{2}+\frac{1}{4}=\frac{(1\times 4-2\times 1)}{2\times 4}=\frac{4-2}{8}\right)=\frac{2}{8}=\frac{1}{4}\right]$$

(iV) $\frac{7^{\frac{1}{2}}}{8^{\frac{1}{2}}}$

Solution

$= 7^{\frac{1}{2}} \times 8^{\frac{1}{2}}$

$= (7 \times 8)^{\frac{1}{2}}$ [since, $(a^m \times b^m = (a \times b)^m$ laws of exponents]

$= 56^{\frac{1}{2}}$

Thanks

For watching