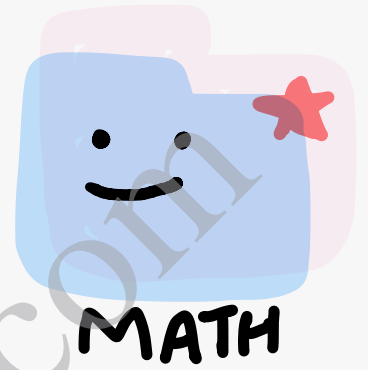


# Number System

Ex. 1.6



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Ex. 1.6

$$\begin{aligned} 1 \text{ (i)} & 64^{\frac{1}{2}} \\ &= (8^2)^{\frac{1}{2}} \\ &= 8^{2 \times \frac{1}{2}} \quad [ \because (a^m)^n = a^{mn} ] \\ &= 8 \end{aligned}$$

$$\begin{aligned} \text{(ii)} & 32^{\frac{1}{5}} \\ &= (2^5)^{\frac{1}{5}} \\ &= 2^{5 \times \frac{1}{5}} \quad [ \because (a^m)^n = a^{mn} ] \\ &= 2 \end{aligned}$$

$$\begin{aligned} \text{(iii)} & 125^{\frac{1}{3}} \\ &= (5^3)^{\frac{1}{3}} \\ &= 5^{3 \times \frac{1}{3}} \quad [ \because (a^m)^n = a^{mn} ] \\ &= 5 \end{aligned}$$

$$\begin{aligned} 2 \text{ (i)} & 9^{\frac{3}{2}} \\ &= (3^2)^{\frac{3}{2}} \\ &= 3^{2 \times \frac{3}{2}} \quad [ \because (a^m)^n = a^{mn} ] \\ &= 3^3 \\ &= 27 \end{aligned}$$

$$\begin{aligned} \text{(ii)} & 32^{\frac{2}{5}} \\ &= (2^5)^{\frac{2}{5}} \\ &= 2^{5 \times \frac{2}{5}} \quad [ \because (a^m)^n = a^{mn} ] \\ &= 2^2 \\ &= 4 \end{aligned}$$

$$\begin{aligned} \text{(iii)} & 16^{\frac{3}{4}} \\ &= (2^4)^{\frac{3}{4}} \\ &= 2^{4 \times \frac{3}{4}} \quad [ \because (a^m)^n = a^{mn} ] \\ &= 2^3 \\ &= 8 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} & 125^{-\frac{1}{3}} \\
 &= (5^3)^{-\frac{1}{3}} \\
 &= 5^{3 \times (-\frac{1}{3})} \quad [\because (a^m)^n = a^{mn}] \\
 &= 5^{-1} \\
 &= \frac{1}{5} \quad [\because a^{-1} = \frac{1}{a}]
 \end{aligned}$$

$$\begin{aligned}
 3 \text{ (i)} & 2^{\frac{2}{3}} \cdot 2^{\frac{1}{5}} \\
 &= 2^{\frac{2}{3} + \frac{1}{5}} \quad [\because a^m \times a^n = a^{m+n}] \\
 &= 2^{\frac{10+3}{15}} \\
 &= 2^{\frac{13}{15}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(ii)} & \left(\frac{1}{3^3}\right)^7 \\
 &= \frac{1^7}{(3^3)^7} \quad [\because \left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}] \\
 &= \frac{1}{3^{3 \times 7}} \\
 &= \frac{1}{3^{21}} \quad [\because (a^m)^n = a^{mn}]
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii)} & \frac{11^{\frac{1}{2}}}{11^{\frac{1}{4}}} \\
 &= 11^{\frac{1}{2} - \frac{1}{4}} \quad [\because a^m \div a^n = a^{m-n}] \\
 &= 11^{\frac{2-1}{4}} \\
 &= 11^{\frac{1}{4}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(iv)} & 7^{\frac{1}{2}} \cdot 8^{\frac{1}{2}} \\
 &= (7 \times 8)^{\frac{1}{2}} \quad [\because a^m \times b^m = (ab)^m] \\
 &= 56^{\frac{1}{2}}
 \end{aligned}$$