

Exercise 1.5

1. Find: (i) $64^{1/2}$ (ii) $32^{1/5}$ (iii) $125^{1/3}$.

Sol. (i) $64^{1/2} = (8^2)^{1/2} = (8)^{2 \times 1/2} = 8.$

(ii) $32^{1/5} = (2^5)^{1/5} = (2)^{5 \times 1/5} = 2.$

(iii) $125^{1/3} = (5^3)^{1/3} = (5)^{3 \times 1/3} = 5.$

2. Find: (i) $9^{3/2}$ (ii) $32^{2/5}$ (iii) $16^{3/4}$ (iv) $125^{-1/3}$.

Sol. (i) $9^{3/2} = (3^2)^{3/2} = (3)^{2 \times 3/2} = (3)^3 = 27.$

(ii) $32^{2/5} = (2^5)^{2/5} = 2^{5 \times 2/5} = (2)^2 = 4.$

(iii) $16^{3/4} = (2^4)^{3/4} = (2)^{4 \times 3/4} = (2)^3 = 8.$

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

3. Simplify: (i) $2^{2/3} \cdot 2^{1/5}$ (ii) $\left(\frac{1}{3^3}\right)^7$ (iii) $\frac{11^{1/2}}{11^{1/4}}$
(iv) $7^{1/2} \cdot 8^{1/2}$.

Sol. (i) $2^{2/3} \cdot 2^{1/5} = 2^{2/3 + 1/5} = 2^{13/15}.$

(ii) $\left(\frac{1}{3^3}\right)^7 = \frac{1}{(3^3)^7} = \frac{1}{3^{3 \times 7}} = \frac{1}{3^{21}} = 3^{-21}.$

(iii) $\frac{11^{1/2}}{11^{1/4}} = 11^{1/2 - 1/4} = 11^{1/4}.$

(iv) $7^{1/2} \cdot 8^{1/2} = (7 \cdot 8)^{1/2} = 56^{1/2}.$