



Powers Ex 2.2 Q6

**Answer :**

$$\begin{aligned} & \left(i\right) \left(\frac{3}{4}\right)^{-2} \quad \longrightarrow (a^{-1} = 1/a) \\ & = \left(\frac{4}{3}\right)^2 \end{aligned}$$

$$\begin{aligned} & \left(ii\right) \left(\frac{5}{4}\right)^{-3} \quad \longrightarrow (a^{-1} = 1/a) \\ & = \left(\frac{4}{5}\right)^3 \end{aligned}$$

$$\begin{aligned} & \left(iii\right) 4^3 \times 4^{-9} \quad \longrightarrow (a^m \times a^n = a^{m+n}) \\ & = 4^{(3-9)} = 4^{-6} \\ & = \left(\frac{1}{4}\right)^6 \end{aligned}$$

$$\begin{aligned}
 \left( iv \right) \left\{ \left( \frac{4}{3} \right)^{-3} \right\}^{-4} &\longrightarrow ((a^m)^n = a^{mn}) \\
 &= \left( \frac{4}{3} \right)^{-4 \times -3} \\
 &= \left( \frac{4}{3} \right)^{12}
 \end{aligned}$$

$$\begin{aligned}
 \left( v \right) \left\{ \left( \frac{3}{2} \right)^4 \right\}^{-2} &\longrightarrow ((a^m)^n = a^{mn}) \\
 &= \left( \frac{3}{2} \right)^{4 \times -2} \\
 &= \left( \frac{3}{2} \right)^{-8} \\
 &= \left( \frac{2}{3} \right)^8
 \end{aligned}$$

Powers Ex 2.2 Q7

**Answer :**

$$\begin{aligned}
 (i) \left( \left( \frac{1}{3} \right)^{-3} - \left( \frac{1}{2} \right)^{-3} \right) \div \left( \frac{1}{4} \right)^{-3} &= \left( \frac{1}{(1/3)^3} - \frac{1}{(1/2)^3} \right) \div \frac{1}{(1/4)^3} \longrightarrow (a^{-n} = \\
 1/(a^n)) & \\
 &= \left( \frac{1}{(1/27)} - \frac{1}{(1/8)} \right) \div \frac{1}{(1/64)} \\
 &= \left( \frac{27}{1} - \frac{8}{1} \right) \div 64 \\
 &= (19) \times \frac{1}{64} \\
 &= \frac{19}{64}
 \end{aligned}$$

$$\begin{aligned}
 (ii) (3^2 - 2^2) \times \left( \frac{2}{3} \right)^{-3} &= (9 - 4) \times \frac{1}{(2/3)^3} \longrightarrow (a^{-n} = 1/(a^n)) \\
 &= 5 \times \frac{1}{8/27} \\
 &= 5 \times \frac{27}{8} \\
 &= \frac{135}{8}
 \end{aligned}$$

$$\begin{aligned}
 (iii) \left( \left( \frac{1}{2} \right)^{-1} \times (-4)^{-1} \right)^{-1} &= \left( \left( \frac{1}{1/2} \right) \times \left( \frac{1}{-4} \right) \right)^{-1} \quad \text{---> } (a^{-1} = 1/a) \\
 &= \left( 2 \times \left( \frac{1}{-4} \right) \right)^{-1} \\
 &= \left( \frac{1}{-2} \right)^{-1} \\
 &= \frac{1}{1/(-2)} \quad \text{---> } (a^{-1} = 1/a) \\
 &= -2
 \end{aligned}$$

$$\begin{aligned}
 (iv) \left( \left( \left( \frac{-1}{4} \right)^2 \right)^{-2} \right)^{-1} &= \left( \left( \frac{(-1)^2}{4^2} \right)^{-2} \right)^{-1} \quad \text{--> } ((a/b)^n = a^n/(b^n)) \\
 &= \left( \left( \frac{1}{16} \right)^{-2} \right)^{-1} \quad \text{---> } (a^{-n} = 1/(a^n)) \\
 &= \left( \left( \frac{1}{(1/16)^2} \right) \right)^{-1} \\
 &= \left( \frac{1}{(1/256)} \right)^{-1} \\
 &= 256^{-1} \quad \text{---> } (a^{-1} = 1/a) \\
 &= \frac{1}{256}
 \end{aligned}$$

$$\begin{aligned}
 (v) \left( \left( \frac{2}{3} \right)^2 \right)^3 \times \left( \frac{1}{3} \right)^{-4} \times 3^{-1} \times 6^{-1} &= \left( \frac{2^2}{3^2} \right)^3 \times \frac{1}{(1/3)^4} \times \frac{1}{3} \times \frac{1}{6} \quad \text{---> } ((a/b)^n = \\
 &\quad a^n/(b^n)) \text{ and } (a^{-n} = 1/(a^n)) \\
 &= \left( \frac{4}{9} \right)^3 \times \frac{1}{(1/81)} \times \frac{1}{3} \times \frac{1}{6} \\
 &= \frac{4^3}{9^3} \times 81 \times \frac{1}{18} \quad \text{---> } ((a/b)^n =
 \end{aligned}$$

$$a^n/(b^n))$$

$$\begin{aligned}
 &= \frac{64}{729} \times 81 \times \frac{1}{18} \\
 &= \frac{64}{9} \times \frac{1}{18} \\
 &= 64 \times \frac{1}{162} \\
 &= \frac{64}{162} \\
 &= \frac{32}{81}
 \end{aligned}$$

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