



Exponents Ex 6.2 Q1

Answer :

We have

$$(i) \ 2^3 \times 2^4 \times 2^5 = 2^{(3+4+5)} = 2^{12} \quad [\text{since } a^m \times a^n \times a^p = a^{(m+n+p)}]$$

$$(ii) \ 5^{12} \div 5^3 = \frac{5^{12}}{5^3} = 5^{12-3} = 5^9 \quad [\text{since } a^m \div a^n = a^{m-n}]$$

$$(iii) \ (7^2)^3 = 7^6 \quad [\text{since } (a^m)^n = a^{mn}]$$

$$(iv) \ (3^2)^5 \div 3^4 = 3^{10} \div 3^4 = 3^{(10-4)} = 3^6$$

$$[\text{since } (a^m)^n = a^{mn}]$$

$$[\text{since } a^m \div a^n = a^{m-n}]$$

$$(v) \ 3^7 \times 2^7 = (3 \times 2)^7 = 6^7 \quad [\text{since } a^m \times b^m = (a \times b)^m]$$

$$(vi) \ (5^{21} \div 5^{13}) \times 5^7 = 5^{(21-13)} \times 5^7$$

$$= 5^8 \times 5^7$$

$$= 5^{(8+7)}$$

$$= 5^{15}$$

$$[\text{since } a^m \div a^n = a^{m-n}]$$

$$[\text{since } a^m \times b^n = a^{(m+n)}]$$

Exponents Ex 6.2 Q2

Answer :

We have

$$\begin{aligned} \text{(i)} \quad & \{(2^3)^4 \times 2^8\} \div 2^{12} \\ &= \{2^{12} \times 2^8\} \div 2^{12} \\ &= 2^{(12+8)} \div 2^{12} \\ &= 2^{20} \div 2^{12} \\ &= 2^{(20-12)} = 2^8 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & (8^2 \times 8^4) \div 8^3 \\ &= 8^{(2+4)} \div 8^3 \\ &= 8^6 \div 8^3 \\ &= 8^{(6-3)} = 8^3 = (2^3)^3 = 2^9 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & \left(\frac{5^7}{5^2}\right) \times 5^3 = 5^{(7-2)} \times 5^3 \\ &= 5^5 \times 5^3 \\ &= 5^{(5+3)} = 5^8 \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & \frac{5^4 \times x^{10} y^5}{5^4 \times x^7 y^4} = 5^{(4-4)} \times x^{(10-7)} \times y^{(5-4)} \\ &= 5^0 \times x^3 \times y \quad [\text{since } 5^0 = 1] \\ &= 1 \times x^3 y = x^3 y \end{aligned}$$

Exponents Ex 6.2 Q3

Answer :

We have

$$\begin{aligned} \text{(i)} \quad & \{(3^2)^3 \times 2^6\} \times 5^6 \\ &= \{3^6 \times 2^6\} \times 5^6 && [\text{since } (a^m)^n = a^{mn}] \\ &= 6^6 \times 5^6 && [\text{since } a^m \times b^m = (a \times b)^m] \\ &= 30^6 \end{aligned}$$

(ii)

$$\begin{aligned} & \left(\frac{x}{y}\right)^{12} \times y^{24} \times (2^3)^4 \\ &= \frac{x^{12}}{y^{12}} \times y^{24} \times 2^{12} \\ &= x^{12} \times \frac{y^{24}}{y^{12}} \times 2^{12} \\ &= x^{12} \times y^{24-12} \times 2^{12} \\ &= x^{12} \times y^{12} \times 2^{12} \\ &= (2xy)^{12} [\text{since } a^m \times b^m \times c^m = (a \times b \times c)^m] \end{aligned}$$

(iii)

$$\begin{aligned} & \left(\frac{5}{2}\right)^6 \times \left(\frac{5}{2}\right)^2 \\ &= \left(\frac{5}{2}\right)^8 \left[\text{since } a^m \times a^n = a^{m+n}\right] \end{aligned}$$

(iv)

$$\begin{aligned} & \left(\frac{2}{3}\right)^5 \times \left(\frac{3}{5}\right)^5 \\ &= \left(\frac{2}{3} \times \frac{3}{5}\right)^5 \left[\text{since } a^m \times b^m = (a \times b)^m\right] \\ &= \left(\frac{2}{5}\right)^5 \end{aligned}$$

Exponents Ex 6.2 Q4

Answer :

We have

$$9 \times 9 \times 9 \times 9 \times 9 = (9)^5 = (3^2)^5 = 3^{10}$$

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