

MATHEMATICS

Class-7th

Chapter-13

*Exponents
and
Powers*

Exercise-13.2

Part-III

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Q.5. Simplify:

$$(i) \frac{(2^5)^2 \times 7^3}{8^3 \times 7}$$

prime factor form of 8 = 2^3

Therefore,

$$\frac{(2^5)^2 \times 7^3}{8^3 \times 7} = \frac{(2^5)^2 \times 7^3}{(2^3)^3 \times 7}$$

$$= \frac{2^{10} \times 7^3}{2^9 \times 7^1} \quad [\because (a^m)^n = a^{mn}]$$

$$= 2^{10-9} \times 7^{3-1} \quad [a^m \div a^n = a^{m-n}]$$

$$= 2 \times 7^2$$

$$= 2 \times 7 \times 7 = 98.$$

$$(ii) \frac{25 \times 5^2 \times t^8}{10^3 \times t^4}$$

prime factor form of 25 = 5^2

$$10 = 2 \times 5$$

$$\text{Therefore, } \frac{25 \times 5^2 \times t^8}{10^3 \times t^4} = \frac{5^2 \times 5^2 \times t^8}{(2 \times 5)^3 \times t^4}$$

$$= \frac{5^{-2+2} \times t^8}{2^3 \times 5^3 \times t^4}$$

$$\left[\begin{array}{l} \text{Using } a^m \times a^n = a^{m+n} \\ \text{And } (ab)^m = a^m \times b^m \end{array} \right]$$

$$= \frac{5^4 \times t^8}{2^3 \times 5^3 \times t^4}$$

$$= \frac{5^{4-3} \times t^{8-4}}{2^3} = \frac{5 \times t^4}{8}$$

$$= \frac{5}{8} t^4$$

$$(ii) \frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5}$$

prime factor form: ob.

$$10 = 2 \times 5$$

$$25 = 5 \times 5 = 5^2$$

$$\text{and } 6 = 2 \times 3$$

Therefore

$$\frac{3^5 \times 10^5 \times 25}{5^7 \times 6^5} = \frac{3^5 \times (2 \times 5)^5 \times 5^2}{5^7 \times (2 \times 3)^5}$$

$$= \frac{3^5 \times 2^5 \times 5^5 \times 5^2}{5^7 \times 2^5 \times 3^5}$$

$$\text{Using } (ab)^m = a^m \times b^m$$

$$= \frac{2^5 \times 3^5 \times 5^{5+2}}{2^5 \times 3^5 \times 5^7}$$

$$= \frac{2^5 \times 3^5 \times 5^7}{2^5 \times 3^5 \times 5^7}$$

$$= 2^{5-5} \times 3^{5-5} \times 5^{7-7}$$

$$= 2^0 \times 3^0 \times 5^0$$

$$= 1 \times 1 \times 1 \quad [\text{Using } a^0 = 1]$$

$$= 1.$$

Q. 6. Express

(i) 729 as a power of 3.

$$\begin{aligned} \text{Sol. } 729 &= 3 \times 3 \times 3 \times 3 \times 3 \times 3 \\ &= 3^6 \end{aligned}$$

3 raised to the power of 6.

(ii) 128 as power of 2

$$\begin{aligned} 128 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= 2^7 \end{aligned}$$

2 raised to the power of 7.

(iii) 343 as power of 7

$$343 = 7 \times 7 \times 7 = 7^3.$$

∞ The End.