

# MATHEMATICS

Class-7th

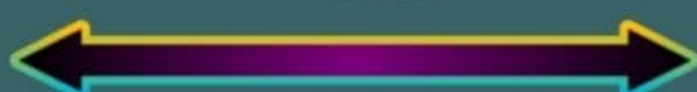
Chapter-13

Exponents  
and Powers

Exercise-13.2

Part-II

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(viii)  $\frac{2^8 \times a^5}{4^3 \times a^3}$

We know that prime factor form of  $4 = 2 \times 2 = 2^2$

Therefore,

$$\frac{2^8 \times a^5}{4^3 \times a^3} = \frac{2^8 \times a^5}{(2^2)^3 \times a^3}$$

$$= \frac{2^8 \times a^5}{2^6 \times a^3}$$

$$= (2)^{8-6} \times (a)^{5-3}$$

$$\left[ \text{Using } a^m \div a^n = a^{m-n} \right]$$

$$= 2^2 \times a^2$$

$$= (2a)^2 \left[ \text{Using } a^m \times b^m = (ab)^m \right]$$

(ix)  $\frac{a^5}{a^3} \times a^8$

$$= (a^{5-3}) \times a^8$$

$$\left[ \text{Using } a^m \div a^n = a^{m-n} \right]$$

$$= a^2 \times a^8$$

$$= (a)^{2+8} = a^{10} \text{ an exponential form}$$

(x)  $\frac{4^5 \times a^8 b^3}{4^5 \times a^5 b^2}$

prime factor form of  $4 = 2^2$

Therefore,  $\frac{4^5 \times a^8 b^3}{4^5 \times a^5 b^2} = \frac{(2^2)^5 \times a^8 b^3}{(2^2)^5 \times a^5 b^2}$

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

$$\left[ \text{Using } (a^m)^n = a^{mn} \right]$$

$$= \frac{2^{10} \times a^8 b^3}{2^{10} \times a^5 b^2}$$

$$= (2)^{10-10} \times a^{8-5} \times b^{3-2}$$

$$\left[ \text{Using } a^m \div a^n = \frac{a^m}{a^n} = a^{m-n} \right]$$

$$= 2^0 \times a^3 \times b^1$$

$$= 1 \times a^3 \times b = a^3 b. \text{ An exponential form.}$$

$$(x1) (2^3 \times 2)^2$$

$$= (2^{3+1})^2 \left[ \text{Using } a^m \times a^n = a^{m+n} \right]$$

$$= (2^4)^2$$

$$\left[ \text{Using } (a^m)^n = a^{mn} \right]$$

$$= 2^8.$$

Q.3. Say true or false and justify.

$$(i) 10 \times 10^{11} = 100^{11}$$

False;  $10 \times 10^{11} = 100^{11}$

Justification:

$$\text{LHS} = 10 \times 10^{11}$$

$$= 10^1 \times 10^{11}$$

$$= (10)^{1+11}$$

$$= 10^{12}$$

$$\left[ \text{Using } a^m \times a^n = a^{m+n} \right]$$

$$\begin{aligned}\underline{\text{RHS}} &= 100^{11} \\ &= (10^1 \times 10^1)^{11} \\ &= (10^2)^{11} \\ &= (10)^{2 \times 11} \\ &= 10^{22}\end{aligned}$$

$$\text{Using } (a^m)^n = a^{mn}.$$

$$\underline{\text{Since}}, 10^{12} \neq 10^{22}$$

$$\underline{\text{Therefore}}, 10 \times 10^{11} \neq 100^{11}$$

$$(ii) \quad 2^3 > 5^2$$

$$\underline{\text{false}}; 2^3 > 5^2$$

Justification:

$$2^3 = 2 \times 2 \times 2 = 8$$

$$\underline{\text{And}}, 5^2 = 5 \times 5 = 25$$

$$\text{Since, } 8 < 25$$

$$\underline{\text{Therefore}}, 2^3 < 5^2$$