

# CLASS NOTES

Class: VII

Topic: Ch 13 EXPONENTS AND POWERS

Date: 19/01/2021

Subject: MATHEMATICS

## EXERCISE 13.2

### 3. Say true or false and justify your answer:

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

**Solution:-**

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

$$= 10^{1+11} \dots [\because a^m \times a^n = a^{m+n}]$$

$$= 10^{12}$$

$$\text{Now, RHS} = 100^{11} = (10 \times 10)^{11}$$

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

$$= (10^2)^{11}$$

$$= (10)^{2 \times 11} \dots [\because (a^m)^n = a^{mn}]$$

$$= 10^{22}$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the given statement is false.

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

**Solution:-**

$$\text{LHS} = 2^3 = 2 \times 2 \times 2 = 8$$

$$\text{RHS} = 5^2 = 5 \times 5 = 25$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the given statement is false.

(iii)  $2^3 \times 3^2 = 6^5$

**Solution:-**

$$\text{LHS} = 2^3 \times 3^2 = 2 \times 2 \times 2 \times 3 \times 3 = 72$$

$$\text{RHS} = 6^5 = 6 \times 6 \times 6 \times 6 \times 6 = 7776$$

$$72 \neq 7776$$

$$\text{LHS} \neq \text{RHS}$$

Hence, the given statement is false.

### 4. Express each of the following as a product of prime factors only in exponential form:

(i)  $108 \times 192$

**Solution:-**

The factors of  $108 = 2 \times 2 \times 3 \times 3 \times 3$

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

The factors of  $192 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$

$$= 2^6 \times 3$$

$$\therefore 108 \times 192 = (2^2 \times 3^3) \times (2^6 \times 3)$$

$$= 2^{2+6} \times 3^{3+1} \dots [\because a^m \times a^n = a^{m+n}]$$

$$= 2^8 \times 3^4$$

**(ii) 270**

**Solution:-**

The factors of  $270 = 2 \times 3 \times 3 \times 3 \times 5$

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

**(iii) 729 × 64**

**Solution:-**

The factors of  $729 = 3 \times 3 \times 3 \times 3 \times 3 \times 3$

$$= 3^6$$

The factors of  $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$$= 2^6$$

$$\therefore 729 \times 64 = (3^6 \times 2^6)$$

**5. Simplify:**

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

**Solution:-**

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

$$= (2^3)^3$$

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

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

$$= \frac{2^{5 \times 2} \times 7^3}{2^{3 \times 3} \times 7} \quad [\because (a^m)^n = a^{mn}]$$

$$= \frac{2^{10} \times 7^3}{2^9 \times 7}$$

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

$$= 2 \times 7^2$$

$$= 2 \times 7 \times 7$$

$$= 98$$

Assignment – Q3 (IV) and Q4 (IV)