

Jender Heart High School, Sec: 33 Bad.

Class: VIII

Teacher: Deepthi

Subject: Mathematics

Topic: Chapter-2 : Exponents and power

If a number is multiplied many numbers of times, we can write it in two different form

(i) Product form

$$2 \times 2 \times 2 \times 2 \times 2 = 32$$

(ii) exponential form

$$\text{or } 2 \times 2 \times 2 \times 2 \times 2 = 2^5$$

So,

2^5 → exponent/power/index

2 → base

parts of exponent

1. If the bases are same and there is a "multiply sign" then the powers get added up

$$a^m \times a^n = a^{m+n}$$

2. If the bases are same and there is a "divide sign" then the powers get subtracted

$$a^m \div a^n = a^{m-n}$$

3. $(a^m)^n = a^{m \times n}$

The product of powers

4. $a^0 = 1$

Any thing raise to power zero is always 1

5. $a^{-m} = \frac{1}{a^m}$ or $\frac{1}{a^{-m}} = a^m$

6. If $a^m = a^n$ (means if the bases are same, power are equal)
 $\Rightarrow m = n$

7. If $\sqrt[n]{a} = (a)^{1/n}$

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Exercise - 2A

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Ans 1 (ii) $x^5 \times (x^{-3}) = x^{5+(-3)} = x^{5-3} = x^2$

ix) $x^6 y^4 z^{-2} \times x^{-3} y^{-5} z^{-1} \times x^2 z^4$
 $= x^{6-3+2} y^{4-5} z^{-2-1+4}$
 $= x^5 y^{-1} z^1 = \frac{x^5 z}{y}$

Ans 2 v) $7a^{12} \div 56a^{15} = \frac{7a^{12}}{56a^{15}} = \frac{1}{8} a^{12-15}$
 $= \frac{1}{8} a^{-3} = \frac{1}{8a^3}$

Ans 3 v) $(3x^3 y^{-3})^2 = 3^2 \times x^{3 \times 2} \times y^{-3 \times 2}$
 $= 9 \times x^6 y^{-6} = \frac{9x^6}{y^6}$

Ans 4 vi) $(32)^{-4/5} = (2^5)^{-4/5} = 2^{-4} = \frac{1}{2^4} = \frac{1}{16}$

Ans 5 iv) $(81a^4 b^8 c^{-4})^{1/4} = (81)^{1/4} a^{4 \times \frac{1}{4}} b^{8 \times \frac{1}{4}} c^{-4 \times \frac{1}{4}}$
 $= 3^{4 \times \frac{1}{4}} a^1 b^2 c^{-1}$
 $= \frac{3ab^2}{c}$

Ans 6 (i) d.H.S = $\frac{x^{m+n} \times x^{n+1} + x^{1+m}}{(x^m \times x^n \times x^1)^2}$
 $= \frac{x^{m+n+n+1+1+m}}{(x^{m+n+1})^2} = \frac{x^{2m+2n+2}}{x^{2m+2n+2}} = \frac{0}{0} = 1$