CLASS-2

Q.1 If $a+b=5$ and $ab=3$, then what will be the value of (a^3+b^3) ?

यदि $(a+b)=5$ और $ab=3$ है, तो (a^3+b^3) का मान क्या होगा ?

(a) 70 (b) 75

(c) 80 (d) 65

$$(a+b)^3 = a^3+b^3+3ab(a+b)$$

$$5^3 = a^3+b^3+3\times3\times5$$

$$125-45 = a^3+b^3$$

$$\boxed{80 = a^3+b^3}$$

Q.2 If $(a+b)=6$ and $ab=\frac{16}{3}$ then (a^3+b^3) is equal to:

यदि $(a+b)=6$ है $ab=\frac{16}{3}$ है, तो (a^3+b^3) बराबर है)

(a) 190 (b) 150

(c) 220 (d) 120

$(a+b)^3 = 6^3$

$a^3+b^3+3ab(a+b) = 216$

$a^3+b^3+3\times\frac{16}{3}\times 6 = 216$

$a^3+b^3+96 = 216$

$a^3+b^3 = 216-96$

$\boxed{a^3+b^3 = 120}$ Answer

Q 3. If $a+b=8$ and $ab=\frac{32}{3}$, then (a^3+b^3) is equal to:

यदि $(a+b)=8$ और $ab=\frac{32}{3}$ है, तो (a^3+b^3) का बराबर है।

(a) 256 (b) 128

(c) 320 (d) 384

$(a+b)^3 = 8^3$

$a^3+b^3+3ab(a+b) = 512$

$a^3+b^3+3\times\frac{32}{3}\times 8 = 512$

$a^3+b^3+256 = 512$

$a^3+b^3 = 512-256$, $\boxed{a^3+b^3 = 256}$ Answer

Q4. If $a^3+b^3=218$ and $a+b=2$ then the value of ab is.

यदि $a^3+b^3=218$ और $a+b=2$ तो ab का मान है

(a) 34 (b) -35

(c) -31 (d) 32

$$(a+b)^3 = 2^3$$

$$a^3+b^3+3ab(a+b) = 8$$

$$218+3ab(2) = 8$$

$$6ab = 8-218$$

$$6ab = -210$$

$$ab = \frac{-210}{6}$$

$$\boxed{ab = -35}$$ Answer.

Note

$$\frac{x^2+x^3}{x} = \frac{x^2}{x}+\frac{x^3}{x} \rightarrow x^{2-1}+x^{3-1} \rightarrow \boxed{x+x^2}$$

* यदि Base equal है तो गुणा में घातें जुड़ती है व भाग में घातें घटती है।

$$\frac{y^4 + y^5 + y^6 + y^7}{y^2} = ?$$

$$\Rightarrow \frac{y^4}{y^2} + \frac{y^5}{y^2} + \frac{y^6}{y^2} + \frac{y^7}{y^2}$$

$$\Rightarrow y^{4-2} + y^{5-2} + y^{6-2} + y^{7-2}$$

$$\Rightarrow y^2 + y^3 + y^4 + y^5$$

example :- 2

$$\frac{12 + 15 + 18 + 21}{3} = \frac{66}{3} \Rightarrow 22$$

or,

$$\frac{12}{3} + \frac{15}{3} + \frac{18}{3} + \frac{21}{3}$$

$$= 4 + 5 + 6 + 7$$

$$= 22$$

example - 3

$$\frac{y^2 + y^3 + y^4 + y^5}{y^2}$$

y^2 common लेने पर

$$\Rightarrow \frac{y^2(y^0 + y^1 + y^2 + y^3)}{y^2}$$

$$\Rightarrow 1 + y^1 + y^2 + y^3 \quad \text{Answer}$$

अगर Power (-) minus में हो तो,

$x^2 = \frac{1}{x^2}$	$\frac{1}{x^2} = x^{-2}$
$x^{-5} = \frac{1}{x^5}$	$\frac{1}{y^{-200}} = y^{200}$

Q1. $x^2 + x^{-2} = 2$ है तो, $x^{200} + x^{-300} + x^{400} + x^{500}$?

$$x + \frac{1}{x^2} = 2$$

$$\boxed{x = 1}$$

ATQ,

$$x^{200} + x^{-300} + x^{400} + x^{500}$$

$$\Rightarrow 1^{200} + 1^{-300} + 1^{400} + 1^{500}$$

$$= 1 + \frac{1}{1^{300}} + 1 + 1$$

$$= 1 + 1 + 1 + 1 = 4 \quad \text{Ans}$$

यदि, $x+\frac{1}{x} = a$

तो,

$$\boxed{x^2+\frac{1}{x^2} = a^2-2}$$

तो,

$$\boxed{x^3+\frac{1}{x^3} = a^3-3a}$$

यदि

$$x-\frac{1}{x} = a$$

तो,

$$\boxed{x^2+\frac{1}{x^2} = a^2+2}$$

तो,

$$\boxed{x^3-\frac{1}{x^3} = a^3+3a}$$

यदि

$$\left(x+\frac{1}{x}\right)^3 = a^3$$

$$x^3+\frac{1}{x^3}+3\times x\times\frac{1}{x}\left(x+\frac{1}{x}\right) = a^3$$

$$x^3+\frac{1}{x^3}+3a = a^3$$

$$\boxed{x^3+\frac{1}{x^3} = a^3-3a}$$

Q.5 If $a^2 - 4a - 1 = 0$, then the value of $a^2 + \frac{1}{a^2} + 3a - \frac{3}{a}$ is

यदि $a^2 - 4a - 1 = 0$, तो $a^2 + \frac{1}{a^2} + 3a - \frac{3}{a}$ का मान है,

(a) 25 (b) 30

(c) 35 (d) 40

$$a^2 + \frac{1}{a^2} + \left(3a - \frac{3}{a}\right)$$

$$\Rightarrow a^2 + \frac{1}{a^2} + 3\left(a - \frac{1}{a}\right) = 18 + 3 \times 4 = 30 \text{ Ans}$$

$$= a^2 - 4a - 1 = 0$$

$$\frac{a^2 - 1}{a} = \frac{4a}{a}$$

$$\boxed{a - \frac{1}{a} = 4}$$

$$\Rightarrow a^2 + \frac{1}{a^2} = 4^2 + 2$$

$$= 18$$

Q1 यदि $x + \frac{1}{x} = 6$ तो $x^2 + \frac{1}{x^2} = ?$

$\downarrow$

$6^2 - 2 = 36 - 2$

$= 34$ Ans

Q2 यदि $x - \frac{1}{x} = 8$ तो $x^3 - \frac{1}{x^3} = ?$

$\downarrow$

$= 8^3 + 3 \times 8$

$= 512 + 24$

$= 536$ Ans

Q3 यदि $x - \frac{1}{x} = 16$ हो तो $x^2 + \frac{1}{x^2} = ?$

$x - \frac{1}{x} = a$ तो $x^2 + \frac{1}{x^2} = a^2 + 2$

ATQ,

$\Rightarrow 16^2 + 2$

$= 256 + 2$

$= 258$ Answer

Q4. यदि $x + \frac{1}{x} = 4$ तो $x^3 + \frac{1}{x^3} = ?$

$x + \frac{1}{x} = a$, $\boxed{x^3 + \frac{1}{x^3} = a^3 - 3a}$

ATQ,

$= 4^3 - 3 \times 4$

$= 64 - 12 = 52$ Answer

Q.5: यदि $x+\frac{1}{x}=3$ है, तो $x^4+\frac{1}{x^4}=?$

$x+\frac{1}{x}=9$, $\boxed{x^2+\frac{1}{x^2}=9^2-2}$

ATQ,

$$x^2+\frac{1}{x^2} = 3^2-2$$
$$= 7$$
$$x^4+\frac{1}{x^4} = 7^2-2$$
$$= 47 \quad \text{Answer}$$

Q6. यदि $x+\frac{1}{x}=4$ है तो $x^4+\frac{1}{x^4}=?$

$$x^2+\frac{1}{x^2} = 4^2-2$$
$$= 16-2$$
$$= 14$$
$$x^4+\frac{1}{x^4} = (14)^2-2$$
$$= 196-2$$
$$= 194 \quad \text{Answer}$$

Home work

Q.9 If $x^2+\frac{1}{x^2}=66$ then, value of $\frac{x^2-1+2x}{x}$?

यदि $x^2+\frac{1}{x^2}=66$ तो, $\frac{x^2-1+2x}{x}$ का मान = ?

(a) ± 8 (b) 10, -6 (c) 6, -10 (d) ± 4