



Algebraic Identities Ex 4.3 Q14

**Answer :**

In the given problem, we have to find the value of numbers

(i) Given  $111^3 - 89^3$

We can write  $111^3 - 89^3$  as  $(100+11)^3 - (100-11)^3$

We shall use the identity  $(a+b)^3 - (a-b)^3 = 2[b^3 + 3a^2b]$

Here  $a = 100, b = 11$

$$111^3 - 89^3 = 100^3 + 11^3 - 100^3 + 11^3$$

$$= 2[11^3 + 3(100)^2(11)]$$

$$= 2[1331 + 330000]$$

$$= 2[331331]$$

$$= 662662$$

Hence the value of  $111^3 - 89^3$  is 662662

(ii) Given  $46^3 + 34^3$

We can write  $46^3 + 34^3$  as  $(40+6)^3 + (40-6)^3$

We shall use the identity  $(a+b)^3 + (a-b)^3 = 2[a^3 + 3ab^2]$

Here  $a = 40, b = 6$

$$46^3 + 34^3 = (40+6)^3 + (40-6)^3$$

$$= 2[40^3 + 3(6)^2(40)]$$

$$= 2[64000 + 4320]$$

$$= 2[68320]$$

$$= 136640$$

Hence the value of  $46^3 + 34^3$  is 136640

(iii) Given  $104^3 + 96^3$

We can write  $104^3 + 96^3$  as  $(100 + 4)^3 + (100 - 4)^3$

We shall use the identity  $(a + b)^3 + (a - b)^3 = 2[a^3 + 3ab^2]$

Here  $a = 100, b = 4$

$$\begin{aligned}104^3 + 96^3 &= (100 + 4)^3 + (100 - 4)^3 \\&= 2[100^3 + 3(100)(4)^2] \\&= 2[1000000 + 300 \times 16] \\&= 2[1000000 + 4800] \\&= 2[1004800] \\&= 2009600\end{aligned}$$

Hence the value of  $104^3 + 96^3$  is 2009600

(iv) Given  $93^3 - 107^3$

We can write  $93^3 - 107^3$  as  $(100 - 7)^3 - (100 + 7)^3$

We shall use the identity  $(a - b)^3 - (a + b)^3 = -2[b^3 + 3a^2b]$

Here  $a = 100, b = 7$

$$\begin{aligned}93^3 - 107^3 &= (100 - 7)^3 - (100 + 7)^3 \\&= -2[7^3 + 3(7)(100)^2] \\&= -2[343 + 21 \times 10000] \\&= -2[343 + 210000] \\&= -2[210343] \\&= -420686\end{aligned}$$

Hence the value of  $93^3 - 107^3$  is -420686

\*\*\*\*\* END \*\*\*\*\*