



Algebraic Identities Ex 4.3 Q3

**Answer :**

In the given problem, we have to find the value of  $a^3 + b^3$

Given  $a + b = 10, ab = 21$

We shall use the identity  $(a + b)^3 = a^3 + b^3 + 3ab(a + b)$

Here putting  $a + b = 10, ab = 21$ ,

$$(10)^3 = a^3 + b^3 + 3(21)(10)$$

$$1000 = a^3 + b^3 + 630$$

$$1000 - 630 = a^3 + b^3$$

$$370 = a^3 + b^3$$

Hence the value of  $a^3 + b^3$  is  $\boxed{370}$ .

Algebraic Identities Ex 4.3 Q4

**Answer :**

In the given problem, we have to find the value of  $a^3 - b^3$

Given  $a - b = -4, ab = 21$

We shall use the identity  $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$

Here putting  $a - b = -4, ab = 21$ ,

$$(4)^3 = a^3 - b^3 - 3(21)(4)$$

$$64 = a^3 - b^3 - 252$$

$$64 + 252 = a^3 - b^3$$

$$316 = a^3 - b^3$$

Hence the value of  $a^3 - b^3$  is  $\boxed{316}$ .

Algebraic Identities Ex 4.3 Q5

**Answer :**

In the given problem, we have to find the value of  $x^3 + \frac{1}{x^3}$

Given  $x + \frac{1}{x} = 5$

We shall use the identity  $(a+b)^3 = a^3 + b^3 + 3ab(a+b)$

Here putting  $x + \frac{1}{x} = 5$ ,

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

$$5^3 = x^3 + \frac{1}{x^3} + 3\left(\cancel{x} \times \frac{1}{\cancel{x}}\right)\left(x + \frac{1}{x}\right)$$

$$125 = x^3 + \frac{1}{x^3} + 3\left(x + \frac{1}{x}\right)$$

$$125 = x^3 + \frac{1}{x^3} + 3 \times 5$$

$$125 = x^3 + \frac{1}{x^3} + 15$$

$$125 - 15 = x^3 + \frac{1}{x^3}$$

$$110 = x^3 + \frac{1}{x^3}$$

Hence the value of  $x^3 + \frac{1}{x^3}$  is 110

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