

105. If $a^2 + b^2 = 69$ and $a^4 + b^4 = 3409$, then the value of $a^3 + b^3$ is:

यदि $a^2 + b^2 = 69$ और $a^4 + b^4 = 3409$ है, तो $a^3 + b^3$ का मान है:

[A] 506

[B] 407

[C] 429

[D] 473

$$(a^2 + b^2)^2 = a^4 + b^4 + 2a^2b^2$$

$$69^2 = 3409 + 2(ab)^2$$

$$4761 - 3409 = 2(ab)^2$$

$$\frac{1352}{2} = (ab)^2$$

$$26 = ab$$

$$\begin{aligned} & (a+b) \cdot [(a+b)^2 - 3ab] \\ &= 11 \times (121 - 78) \\ &= 11 \times 43 \\ &= 473 \end{aligned}$$

$$(a+b)^2 = 69 + 2 \times 26 = 121$$

$$a+b=11$$

106. If $x^3 + y^3 = 416$ and $x + y = 8$, then find $x^4 + y^4$.

यदि $x^3 + y^3 = 416$ और $x + y = 8$ है, तो $x^4 + y^4$ का मान ज्ञात कीजिए।

[A] 3002

[B] 3204

[C] 3004

[D] 3104

$$(x^2 + y^2)^2 - 2(xy)^2$$

$$= 56^2 - 32$$
$$= 3136 - 32$$

~~$$8 \cdot [8^2 - 3xy] = 416$$~~

$$64 - 3xy = 52$$

$$3xy = 12$$

$$xy = 4$$

$$x^2 + y^2 = (x + y)^2 - 2xy$$
$$= 64 - 8 = 56$$

107. If $x + y = 4$ and $x^3 + y^3 = 12$, then the value of $x^4 + y^4$ will be:

यदि $x + y = 4$ और $x^3 + y^3 = 12$ है, तो $x^4 + y^4$ का मान होगा:

[A] $\frac{146}{9}$

[B] $\frac{131}{9}$

[C] $\frac{143}{9}$

[D] $\frac{127}{9}$

$$(x^2 + y^2)^2 - 2(xy)^2$$

$$= \frac{484}{9} - 2 \times \frac{169}{9}$$

$$= \frac{146}{9}$$

$$x^3 + y^3 = 12$$

$$\cancel{4x(4^2 - 3xy)} = \cancel{12^3}$$

$$xy = \frac{13}{3}$$

$$x^2 + y^2 = 4^2 - 2 \times \frac{13}{3} = \frac{22}{3}$$

108. If $8a^3 + 27b^3 = 16$ & $2a + 3b = 4$, then find the value of $16a^4 + 81b^4$?

यदि $8a^3 + 27b^3 = 16$ & $2a + 3b = 4$ है, तो $16a^4 + 81b^4$ का मान ज्ञात कीजिए?

[A] 26

[C] 28

[B] 30

[D] 32 ✓

$$\begin{aligned} & (2a)^4 + (3b)^4 \\ &= 16 + 16 \end{aligned}$$

109. If $a + b = p$, $ab = q$, then $(a^4 + b^4)$ is equal to:

यदि $a + b = p$, $ab = q$ है, तो $(a^4 + b^4)$ का मान ज्ञात कीजिए।

[A] $p^4 - 2p^2q^2 + q^2$

[C] $p^4 - 4p^2q + q^2$

[B] $p^4 - 4p^2q^2 + 2q^2$

[D] $p^4 - 4p^2q + 2q^2$

$$a^2 + b^2 = p^2 - 2q$$

$$\begin{aligned} & (a^2 + b^2)^2 - 2(ab)^2 \\ &= (p^2 - 2q)^2 - 2q^2 \\ &= p^4 + 4q^2 - 4p^2q - 2q^2 \end{aligned}$$

110. If $a^3 - b^3 = 260$, $a - b = 8$ then $a^4 + b^4 = ?$

यदि $a^3 - b^3 = 260$ और $a - b = 8$ है, तो $a^4 + b^4 = ?$

[A] 1682.5

[C] 1862.5

☒ [B] 1628.5

[D] 1268.5


$$ab = -\frac{21}{2}$$

$$(8^2 + 3ab) = \frac{65}{2}$$

$$3ab = \frac{65}{2} - 64$$

$$3ab = -\frac{53}{2}$$

$$\begin{aligned} (a^2 + b^2)^2 - 2(ab)^2 &= 43^2 - 2 \times \frac{441}{4} \\ &= 1849 - 220.5 = 1628.5 \end{aligned}$$

$$\begin{aligned} a^2 + b^2 &= (a - b)^2 + 2ab \\ &= 64 + 2\left(-\frac{21}{2}\right) = 43 \end{aligned}$$



111. If $x + y = 3, x^2 + y^2 = 7$, then find the value of $x^6 + y^6 = ?$
यदि $x + y = 3, x^2 + y^2 = 7$ है, तो $x^6 + y^6$ का मान ज्ञात कीजिये?

[A] 322

[C] 342

[B] 321

[D] 329

$$(x^3 + y^3)^2 - 2(xy)^3$$

$$= 324 - 2$$

$$= 322$$

$$xy = \frac{3^2 - 7}{2} = 1$$

$$x^3 + y^3 = 3x(3^2 - 3 \times 1) = 18$$



112. If $x - y = 4$ and $x^3 - y^3 = 316$, $y > 0$ then the value of $x^4 - y^4$ is:
यदि $x - y = 4$ और $x^3 - y^3 = 316$ है, $y > 0$ है, तो $x^4 - y^4$ का मान ज्ञात करें।
- [A] 2482 [B] 2320
[C] 2500 [D] 2401

~~$4x(4^2 + 3xy) = 316$~~

$3xy = 63$

$xy = 21$

114. If $a + b = 24$ and $a^2 + b^2 = 306$, where $a > b$, then the value of $4a - 5b$ is:

यदि $a + b = 24$ और $a^2 + b^2 = 306$ है, जहां, $a > b$ है, तो $4a - 5b$ का मान ज्ञात करें।

[A] 18

[C] 12

[B] 20

[D] 15 ✓

$$ab = \frac{24^2 - 306}{2}$$

$$15 \times 9 = 135$$

15 9 $60 - 45 = 15$



113. If $a + b = 2$ and $ab = 4$, then find the value of $a^4 + b^4 + ab^3 + ba^3$.

यदि $a + b = 2$ तथा $ab = 4$ है, तो $a^4 + b^4 + ab^3 + ba^3$ का मान ज्ञात कीजिए।

[A] 18

[B] -16

[C] -32

[D] 24

$$= a \cdot (a^3 + b^3) + b \cdot (b^3 + a^3)$$

$$= (a^3 + b^3) \times (a + b)$$

$$2 \times (2^3 - 3 \times 4) \times 2$$

$$= -32$$