

69. If $u - v = 4$ and $uv = 20$, then find the value of $u^3 - v^3$.

यदि $u - v = 4$ और $uv = 20$ है, तो $u^3 - v^3$ का मान ज्ञात करें।

[RRB Group D-2022]

[A] 224

[B] 304

[C] 64

[D] 176

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$$u^3 - v^3 = (u - v) \cdot [(u - v)^2 + 3uv]$$

$$= 4 \times [4^2 + 3 \times 20]$$

$$= 4 \times 76$$

$$= 304$$

70. If $(m - n) = 4$ and $(m^3 - n^3) = 1216$, then find the value of $(m \times n)$.

अगर $(m - n) = 4$ और $(m^3 - n^3) = 1216$ है, तो $(m \times n)$ का मान ज्ञात कीजिए।

(RRB TECHNICIAN GRADE-3, 2024)

[A] 89

[C] 75

[B] 96

[D] 91

$$\cancel{4 \times [4^2 + 3mn] = 1216}^{304}$$

$$\cancel{3mn = 203}$$

$$mn = 96$$

$$a^3 - b^3 = (a - b) \cdot [(a - b)^2 + 3ab]$$



71. If $x + y = 13$ and $x^2 + y^2 = 101$, then the value of $x^3 + y^3$ will be:

यदि $x + y = 13$ और $x^2 + y^2 = 101$, तो $x^3 + y^3$ का मान होगा:

(RRB NTPC GRADUATE LEVEL CBT-1, 2025)

[A] 767

[B] 949

[C] 793

[D] 871

$$= (x+y) \cdot [(x+y)^2 - 3xy]$$

$$xy = \frac{(x+y)^2 - (x^2 + y^2)}{2}$$

$$= \frac{13^2 - 101}{2} = 34$$

$$= 13 \times (169 - 3 \times 34)$$

$$= 13 \times 67$$

72. If $a + b = \frac{7}{3}$, $a^2 + b^2 = \frac{31}{9}$, then find $27(a^3 + b^3) = ?$

यदि $a + b = \frac{7}{3}$, $a^2 + b^2 = \frac{31}{9}$, तो $27(a^3 + b^3)$ ज्ञात कीजिए।

(RRB NTPC GRADUATE LEVEL CBT-1, 2025)

[A] 117

[B] 154

[C] 126

[D] 168

$$= 27 \cdot (a+b) \cdot [(a+b)^2 - 3ab]$$

$$ab = \frac{\frac{49}{9} - \frac{31}{9}}{2} = \frac{\frac{18}{9}}{2} = 1$$

$$= 27 \times \frac{7}{3} \cdot \left[\frac{49}{9} - 3 \right]$$

$$= \cancel{27} \times \frac{7}{3} \times \frac{22}{9}$$

$$= 154$$

73. If $a^2 + b^2 = 95$ and $ab = 13$, ($a > 0, b > 0$) then the value of $(a^3 + b^3)$ is:

यदि $a^2 + b^2 = 95$ और $ab = 13$, ($a > 0, b > 0$) है तो $(a^3 + b^3)$ का मान है:

[A] ~~861~~

[B] ~~968~~

[C] ~~1100~~

☒ [D] 902

$$\begin{aligned}(a+b)^2 &= a^2 + b^2 + 2ab \\ &= 95 + 26 \\ &= 121\end{aligned}$$

$$a+b=11$$

$$\begin{aligned}(a+b) \cdot (a^2 + b^2 - ab) \\ \downarrow \\ = 11 \times 89 \\ = 902\end{aligned}$$

74. If $x + y = 17$ and $xy = 25$, $x > y$, then the value of $(x^3 - y^3)$ is:

यदि $x + y = 17$ और $xy = 25$, $x > y$, है, तो $(x^3 - y^3)$ का मान है?

[A] $792\sqrt{21}$

[B] $702\sqrt{21}$

[C] $724\sqrt{23}$

[D] none

$$= (x - y) \cdot [(x - y)^2 + 3xy]$$

$$(x - y) = \sqrt{(x + y)^2 - 4xy}$$

$$= \sqrt{289 - 100}$$

$$= \sqrt{189} = \sqrt{9 \times 21} = 3\sqrt{21}$$

$$= \sqrt{189} \times (189 + 75)$$

$$= 3\sqrt{21} \times 264$$

$$= 792\sqrt{21}$$

75. If $x^3 = 270 + y^3$ & $x = (6 + y)$, then what is the value of $(x+y)$? (given that $x > 0$ & $y > 0$)
अगर $x^3 = 270 + y^3$ और $x = (6 + y)$ है, तो $(x+y)$ का मान क्या होगा? (दिया गया है कि $x > 0$ और $y > 0$)

[A] $2\sqrt{3}$

[B] $\sqrt{3}$

[C] $4\sqrt{3}$

[D] $4\sqrt{2}$

$$x^3 - y^3 = 270 \quad \& \quad x - y = 6$$

$$\downarrow$$
$$\cancel{6} \times [6 + 3xy] = \cancel{270}^{45}$$

$$3xy = 9$$

$$xy = 3$$

$$\begin{aligned}(x+y) &= \sqrt{(x-y)^2 + 4xy} \\&= \sqrt{36 + 12} \\&= \sqrt{48} \\&= 4\sqrt{3}\end{aligned}$$

76. If $5x + y = 17$ and $xy = 6$, then what is the value of $125x^3 + y^3$?

यदि $5x + y = 17$ और $xy = 6$ तो $125x^3 + y^3$ का मान क्या है?

SSC CHSL TIER – I 2022

[A] 3383

[C] 3183

[B] 1530

[D] 4913

$$125 \times 27 + 8$$

hit & trial

$$15^3$$

77. If $3a + 4b = 2$ and $ab = \frac{1}{36}$, then find the value of $27a^3 + 64b^3$.

यदि $3a + 4b = 2$ और $ab = \frac{1}{36}$ है, तो $27a^3 + 64b^3$ का मान ज्ञात कीजिए।

[RRB NTPC - 2021]

[A] 6 ✓

[C] 8

[B] 4

[D] 2

$$(3a)^3 + (4b)^3$$

$$= (3a + 4b) \times [(3a + 4b)^2 - 3 \times 3a \times 4b]$$

$$= 2 \times \left(4 - \cancel{36} \times \frac{1}{\cancel{36}} \right)$$

$$= 6$$

78. If $2x + 3y = 8$ and $4x^2 + 9y^2 = 32$, find the value of $8x^3 + 27y^3$.

यदि $2x + 3y = 8$ और $4x^2 + 9y^2 = 32$ है, तो $8x^3 + 27y^3$ का मान ज्ञात कीजिए।

[RRB Group D-2022]

[A] 128

[B] 142

[C] 106

[D] 112

79. If $16x^2 + y^2 = \frac{65}{36}$ and $xy = \frac{1}{18}$, $x, y > 0$, then what is the value of $(64x^3 + y^3)$?

यदि $16x^2 + y^2 = \frac{65}{36}$ और $xy = \frac{1}{18}$, $x, y > 0$ है, तो $(64x^3 + y^3)$ का मान क्या होगा?

[A] $\frac{19}{4}$

[B] $\frac{27}{4}$

[C] $\frac{27}{8}$

[D] $\frac{19}{8}$

$$(4x)^3 + y^3 = (4x + y) \cdot [(4x + y)^2 - 12xy]$$

$$(4x + y)^2 = (16x^2 + y^2) + 8xy$$

$$= \frac{65}{36} + \frac{8}{18} = \frac{81}{36} = \frac{9}{4}$$

$$4x + y = \frac{3}{2}$$

$$= \frac{3}{2} \times \left(\frac{9}{4} - \frac{12}{18} \right)$$

$$= \frac{27}{8} - 1$$

$$= \frac{19}{8}$$

80. If $3x - 2y = 10$ and $xy = 11$, then find the value of $27x^3 - 8y^3$.
यदि $3x - 2y = 10$ और $xy = 11$ है, तो $27x^3 - 8y^3$ का मान ज्ञात कीजिए।

[RRB Group D-2022]

[A] 2569

[B] 3336

[C] 3170

[D] 2980

$$\begin{aligned}
 & (3x)^3 - (2y)^3 \\
 &= 10 \times (10^2 + 18 \times 11) \\
 &= 10 \times 298
 \end{aligned}$$

$$3 \times 3x \times 2y$$

81. If $(4a-3b)=1$, $ab=\frac{1}{2}$, where $a > 0$ and $b > 0$, what is the value of $(64a^3 + 27b^3)$?

यदि $(4a-3b)=1$, $ab=\frac{1}{2}$, जहाँ $a > 0$ और $b > 0$ है, तो $(64a^3 + 27b^3)$ का मान क्या है?

[RRB Group D-2022]

[A] 15

[C] 30

[B] 25

[D] 35 ✓

$$\begin{aligned}(4a+3b) &= \sqrt{(4a-3b)^2 + 4 \times 4a \times 3b} \\ &= \sqrt{1 + 24} \\ &= 5\end{aligned}$$

$$\begin{aligned}&(4a)^3 + (3b)^3 \\ &= (4a+3b) \cdot [(4a+3b)^2 - 36ab] \\ &= 5 \times (25 - 36 \times \frac{1}{2}) \\ &= 35\end{aligned}$$

82. 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] $\frac{127}{9}$

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

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

$$= \frac{484 - 338}{9} = \frac{146}{9}$$

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

$$\downarrow$$

$$4 \times (4^2 - 3xy) = 12$$

$$-3xy = -13$$

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

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

$$= 16 - \frac{26}{3} = \frac{22}{3}$$

83. 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।

(RRB NTPC GRADUATE LEVEL CBT-1, 2021)

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

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

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

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

$$a^2 + b^2 = (a + b)^2 - 2ab$$

$$= p^2 - 2q$$

$$(a^2 + b^2)^2 - 2(ab)^2$$

$$= (p^2 - 2q)^2 - 2q^2$$

84. 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

[B] 20

[C] 12

[D] 15 ✓

$$ab = \frac{24^2 - 306}{2} = \frac{270}{2}$$

$$15 \times 9 = 135$$

85. If $P = \frac{x^3+y^3}{(x-y)^2+3xy}$, $Q = \frac{(x+y)^2-3xy}{x^3-y^3}$ and $R = \frac{(x+y)^2+(x-y)^2}{x^2-y^2}$, then what is the value of $(P \div Q) \times R$?

यदि $P = \frac{x^3+y^3}{(x-y)^2+3xy}$, $Q = \frac{(x+y)^2-3xy}{x^3-y^3}$ और $R = \frac{(x+y)^2+(x-y)^2}{x^2-y^2}$ है, तो $(P \div Q) \times R$ का मान क्या है?

(2019 PRE)

[A] $2xy$

[B] $2(x^2 + y^2)$

[C] $x^2 + y^2$

[D] $4xy$

$$\frac{x^3+y^3}{(x-y)^2+3xy} \times \frac{x^3-y^3}{(x+y)^2-3xy} \times \frac{2(x^2+y^2)}{(x-y)(x+y)}$$

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$$