

50. If $x + y = \sqrt{13}$ and $x - y = \sqrt{11}$, then the value of $xy(x^2 + y^2)$ is:
यदि $x + y = \sqrt{13}$ और $x - y = \sqrt{11}$, तो $xy(x^2 + y^2)$ का मान ज्ञात कीजिये:
(SSC SELECTION POST XI 2023)

[A] 10

[B] 6

[C] $\sqrt{6}$

[D] $\sqrt{10}$

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$$(x+y)^2 + (x-y)^2 = 2(x^2 + y^2) \Rightarrow 13 + 11 = 2(x^2 + y^2)$$

$$13 - 11 = 4xy$$

$$\frac{1}{2} = xy$$

$$\frac{1}{2} \times 12 = 6$$

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$$(a^2 + b^2)^2 = \underline{a^4 + b^4} + 2a^2b^2$$

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

51. If $x + y = 10$ and $xy = 4$, then what is the value of $x^4 + y^4$?

यदि $x + y = 10$ और $xy = 4$ है, तो $x^4 + y^4$ का मान क्या है?

(CGL Mains 2017)

[A] 8464

[C] 7478

[B] 8432

[D] 6218

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

$$= 92^2 - 2 \times 16$$

$$= \dots 4 \dots 2$$

$$\begin{aligned} x^2 + y^2 &= 10^2 - 2 \times 4 \\ &= 92 \end{aligned}$$

52. If $a + b = 12$ and $ab = 35$, find the value of $a^4 + b^4 - 10^3$?

यदि $a + b = 12$ और $ab = 35$ है, तो $a^4 + b^4 - 10^3$ का मान ज्ञात कीजिए?

(SSC CGL 2022)

[A] 2226

[C] 2126

[B] 2026

[D] 1226

$5^4 + 7^4 - 1000$
 $625 + 2401 - 1000$

5×7

53. If $a + b = \sqrt{12}$ & $a - b = \sqrt{8}$, then find $a^4 + b^4$?

यदि $a + b = \sqrt{12}$ & $a - b = \sqrt{8}$ है, तो $a^4 + b^4$ ज्ञात कीजिये?

[A] 94

[B] 96

[C] 95

[D] 98

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

$$\cancel{12} + 8 = \cancel{2}(a^2 + b^2)$$

$$\cancel{12} - 8 = \cancel{2}ab$$

$$1 = ab$$

$$10^2 - 2 \times 1 = 98$$



$$\text{if } a = 1 - b \Rightarrow a + b = 1$$

$$a^2 = 1 - b^2 \Rightarrow a^2 + b^2 = 1$$

$$ab = \frac{1^2 - 2}{2} = -\frac{1}{2}$$

$$\text{तो } a^4 + b^4 = (a^2 + b^2)^2 - 2(ab)^2$$

$$= 4 - \cancel{2} \times \cancel{1} \times \cancel{2}$$

$$= \frac{7}{2}$$



54. If $x^2 - y^2 = 9$, $xy = 3$, then find $x + y$?

यदि $x^2 - y^2 = 9$ और $xy = 3$ है, तो $x + y$ ज्ञात कीजिए।

[A] $\pm\sqrt{6 + 3\sqrt{13}}$

[B] $\pm\sqrt{5 + 13\sqrt{3}}$

[C] $\pm\sqrt{4 + 3\sqrt{13}}$

[D] ± 19

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

$$(x+y)^2 = \sqrt{17} + 6$$

$$x+y = \pm\sqrt{\sqrt{17} + 6}$$

$$\begin{aligned}(x+y)^2 &= (x-y)^2 + 4xy \\ &= 9 + 4 \times 3 \\ &= 17\end{aligned}$$

$$x+y = \sqrt{17}$$



55. The term to be added to $169a^{-2} + 1.44b^2 + 27\frac{b}{a}$ to make a perfect square?

$169a^{-2} + 1.44b^2 + 27\frac{b}{a}$ को पूर्ण वर्ग बनाने के लिए इसमें कौन सा पद जोड़ा जाना चाहिए?

[A] $2ab$

[C] $5a^{-1}b$

[B] $4 \cdot 2ba^{-1}$

[D] $2ba^{-1}$

$$(13a^{-1})^2 + (1.2b)^2 + \underline{2 \times 13a^{-1} \times 1.2b}$$

$31.2a^{-1}b$

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

$$\frac{1}{x^n} = x^{-n}$$

56. For what value(s) of k will the expression $p + \frac{1}{9}\sqrt{p} + k^2$ be a perfect square?

k के किस मान/किन मानों के लिए व्यंजक $p + \frac{1}{9}\sqrt{p} + k^2$ एक पूर्ण वर्ग होगा?

[A] $k = \pm \frac{1}{8}$

[C] $k = \pm \frac{1}{21}$

[B] ~~$k = \pm \frac{1}{9}$~~

[D] $k = \pm \frac{1}{18}$

$$\left(\sqrt{p} + \frac{1}{18}\right)^2$$

$$\sqrt{p}^2 + 2 \times \frac{1}{18} \times \sqrt{p} + \left(\frac{1}{18}\right)^2$$

$$a^2 + 2ab + b^2$$

$$b \rightarrow -b$$



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

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

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

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

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

$$\frac{a^3 + b^3}{a+b} = a^2 + b^2 - ab$$

$$\frac{a^3 + b^3}{a^2 + b^2 - ab} = a + b$$


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

$$(a-b)^3 = \underline{a^3 - b^3} - 3ab(a-b)$$

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

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

$$\frac{a^3 - b^3}{a^2 + ab + b^2} = a - b$$

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



57. If $a^3 + b^3 = 5824$ and $a + b = 28$, then $(a - b)^2 + ab$ is equal to:

यदि $a^3 + b^3 = 5824$ और $a + b = 28$ है, तो $(a - b)^2 + ab$ किसके बराबर है?

(SSC CPO 2019)

[A] 208

[C] 180

[B] 152

[D] 236

$$a^2 + b^2 - ab = \frac{a^3 + b^3}{a + b} = \frac{5824}{28} = 208$$

58. If $a^3 + b^3 = 432$ and $a + b = 12$, then $(a + b)^2 - 3ab$ is equal to:
यदि $a^3 + b^3 = 432$ और $a + b = 12$ है, तो $(a + b)^2 - 3ab$ किसके बराबर है?

(SSC CGL 2018 PRE)

[A] 42

[C] 36

[B] 52

[D] 38

$$a^2 + b^2 - ab = \frac{432}{12} = 36$$

59. If $a^3 - b^3 = 899$ and $a - b = 31$, then $(a - b)^2 + 3ab$ is equal to:

यदि $a^3 - b^3 = 899$ तथा $a - b = 31$, तो $(a - b)^2 + 3ab$ का माना है:

(SSC CPO 2019)

[A] 35

[C] 16

[B] 31

[D] 29

$$= a^2 + b^2 + ab = \frac{899}{31}$$

60. If $a^3 = b^3 + 988$ and $a - b = 4$, then what is the value of $2a^2 + 2ab + 2b^2$?
यदि $a^3 = b^3 + 988$ और $a - b = 4$, तो $2a^2 + 2ab + 2b^2$ का मान क्या है?

SSC CHSL TIER - I 2022

[A] 516

[C] 500

✓ [B] 494

[D] 247

$$= 2 \cdot (a^2 + ab + b^2)$$

$$= 2 \times \frac{988}{4}$$

$$a^3 - b^3 = 988$$

$$a - b = 4$$

61. $0.008X^3 + 0.027Y^3 = 125$ & $0.2X + 0.3Y = 25$, then find $(0.2X + 0.3Y)^2 - 0.18XY$?

यदि $0.008X^3 + 0.027Y^3 = 125$ & $0.2X + 0.3Y = 25$ है, तो $(0.2X + 0.3Y)^2 - 0.18XY$ ज्ञात कीजिये?

[A] 5
[C] 25

[B] 125
[D] 10

$$= \frac{125}{25}$$

$$a \rightarrow 0.2X$$

$$b \rightarrow 0.3Y$$