

if, $x^2 + \frac{1}{x^2} = k$

$$x^2 + \frac{1}{x^2} - 2 = k - 2$$

$$\left(x - \frac{1}{x}\right)^2 = k - 2$$

→ तो $x + \frac{1}{x} = \pm \sqrt{k+2}$

→ तो $x - \frac{1}{x} = \pm \sqrt{k-2}$

if, $x^2 + \frac{1}{x^2} = 79$

तो $x + \frac{1}{x} = \pm \sqrt{79+2} = \pm 9$

$x - \frac{1}{x} = \pm \sqrt{79-2} = \pm \sqrt{77}$

if $\frac{\omega^6}{25} + \frac{25}{\omega^6} = 167$

तो $\frac{\omega^3}{5} + \frac{5}{\omega^3} = \pm 13$

84. If $\frac{x^2}{y^2} + \frac{y^2}{x^2} = 223$, then find $\frac{x}{y} + \frac{y}{x}$?

यदि $\frac{x^2}{y^2} \oplus \frac{y^2}{x^2} = 223$ है, तो $\frac{x}{y} \oplus \frac{y}{x} \rightarrow \pm 15$ ज्ञात करें?

[A] ± 15 ✓

[B] 15

[C] -15

[D] $\sqrt{221}$

85. If $\frac{3(x^2 + 1) - 7x}{3x} = 6, x \neq 0$, then the value of $\sqrt{x} + \frac{1}{\sqrt{x}}$ is:

यदि $\frac{3(x^2 + 1) - 7x}{3x} = 6, x \neq 0$ है, तो $\sqrt{x} + \frac{1}{\sqrt{x}}$ का मान क्या होगा?

(RRB JE 2025)

[A] $\sqrt{\frac{25}{3}}$

[C] $\sqrt{\frac{11}{3}}$

☒ [B] $\sqrt{\frac{31}{3}}$

[D] $\sqrt{\frac{35}{3}}$

$$3(\underline{x^2 + 1}) - 7x = 18x$$

$$x + \frac{1}{x} = \frac{25}{3}$$

$$\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{\frac{25}{3} + 2} = \sqrt{\frac{31}{3}}$$

86. If $x^2 + \frac{1}{x^2} = 123$, then a possible value of $\left(x - \frac{1}{x}\right)$ is:

यदि $x^2 \oplus \frac{1}{x^2} = 123$ है, तो $\left(x - \frac{1}{x}\right)$ का संभावित मान ज्ञात कीजिए।

[RRB Group - D 2025]

[A] 12

[C] 13

[B] 10

[D] 11 ✓

$$\sqrt{123-2}$$

87. If $x^4 + \frac{1}{x^4} = 3842$, then the positive value of $x + \frac{1}{x}$ will be:

यदि $x^4 + \frac{1}{x^4} = 3842$ है, तो $x + \frac{1}{x}$ का धनात्मक मान ज्ञात करें।

[A] 12

[C] 10

☒ [B] 8

[D] 6

$$x^4 + \frac{1}{x^4} = 3842$$

$$x^2 + \frac{1}{x^2} = \sqrt{3844} = 62$$

$$x + \frac{1}{x} = \sqrt{64} = 8$$

88. If $x^4 + \frac{1}{x^4} = 14159$, and $x(x - t) = -1$ then the value of t is:

यदि $x^4 \oplus \frac{1}{x^4} = 14159$ है, $x(x - t) = -1$ तो t का मान ज्ञात करें।

[A] 9

[B] 12

[C] 10

☒ [D] 11

$$= \sqrt{14161} = 119$$

$$= \sqrt{121} = 11$$

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

$$x + \frac{1}{x} = t$$

89. If $x > 1$, and $x^4 + \frac{1}{x^4} = 79$, what is the value of $x - \frac{1}{x}$?

यदि $x > 1$, और $x^4 + \frac{1}{x^4} = 79$, तो $x - \frac{1}{x}$ का मान क्या है?

(SSC SELECTION POST XI 2023)

[A] $2\sqrt{2}$

[B] $\sqrt{7}$

[C] $\sqrt{11}$

[D] $\sqrt{10}$

$$x^4 + \frac{1}{x^4} = 79$$

$$x^2 + \frac{1}{x^2} = \sqrt{81} = 9$$

$$x - \frac{1}{x} = \sqrt{9-2} = \sqrt{7}$$

90. If $x^4 + \frac{1}{x^4} = 6887$, then the positive value of $x - \frac{1}{x}$ is:

यदि $x^4 + \frac{1}{x^4} = 6887$ है, तो $x - \frac{1}{x}$ का धनात्मक मान ज्ञात करें।

[A] 12

☒ [B] 9

[C] 15

[D] 8

$$x^2 + \frac{1}{x^2} = \sqrt{6889} = 83$$

$$x - \frac{1}{x} = \sqrt{83-2} = 9$$

91. If $x^8 - 1442x^4 + 1 = 0$, then a possible value of $x - \frac{1}{x}$ is:

यदि $x^8 - 1442x^4 + 1 = 0$ है, तो $x - \frac{1}{x}$ का एक संभावित मान है:

[A] 5

[C] 6 ✓

[B] 8

[D] 4

✓ $\sqrt{38-2}$

$$x^4 + \frac{1}{x^4} = 1442$$

$$x^2 + \frac{1}{x^2} = \sqrt{1444} = 38$$

92. If $3a^2 + \frac{3}{a^2} = 54$, then the value of $\frac{a^2+2a-1}{a}$ is:

यदि $3a^2 + \frac{3}{a^2} = 54$ है, तो $\frac{a^2+2a-1}{a}$ का मान क्या होगा?

[A] -6, -2

[B] 6, -2

[C] -6, 2

[D] 6, 2

$$a^2 + \frac{1}{a^2} = 18$$

$$a - \frac{1}{a} = \pm \sqrt{18-2} = \pm 4$$

$$= \left(a - \frac{1}{a}\right) + 2$$

$$= 6, -2$$

93. If $x^2 + \frac{1}{x^2} = 38$, then find the value of $\frac{6x(x-1)}{x^3 - x^2 - x + 1}$.

यदि $x^2 + \frac{1}{x^2} = 38$ है, तो $\frac{6x(x-1)}{x^3 - x^2 - x + 1}$ का मान क्या होगा?

[A] 0

[B] 1 ✓

[C] 2

[D] 3

$$x - \frac{1}{x} = 6$$

$$\frac{6x \cdot (x-1)}{x^2(x-1) - 1(x-1)}$$

$$= \frac{6x \cdot \cancel{(x-1)}}{\cancel{(x-1)} \cdot (x^2 - 1)} = \frac{6x}{x^2 - 1} = \frac{6}{x - \frac{1}{x}} = 1$$



94. If $\left(x^2 + \frac{1}{49x^2}\right) = 15\frac{5}{7}$, then what is the value of $\left(x + \frac{1}{7x}\right)$?

यदि $\left(x^2 + \frac{1}{49x^2}\right) = 15\frac{5}{7}$ है, तो $\left(x + \frac{1}{7x}\right)$ का मान क्या होगा?

[A] 7

[B] ± 7

☒ [C] ± 4

[D] ~~4~~

$$\left(x^2 + \left(\frac{1}{7x}\right)^2 + \frac{2}{7}\right) = 15\frac{5}{7} + \frac{2}{7}$$

$$\left(x + \frac{1}{7x}\right)^2 = 16$$

$$x + \frac{1}{7x} = \pm 4$$

95. If $x^8 - 433x^4 + 16 = 0, x > 0$, then what is the value of $\left(x + \frac{2}{x}\right)$?

यदि $x^8 - 433x^4 + 16 = 0, x > 0$ है, तो $\left(x + \frac{2}{x}\right)$ का मान क्या होगा?

[A] 5 ✓

[B] 7

[C] 4

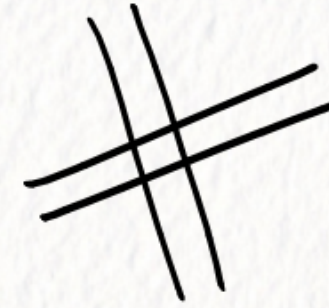
[D] 9

$$x^4 + \frac{16}{x^4} + 8 = 433 + 8$$

$$\left(x^2 + \frac{4}{x^2}\right)^2 = 441$$

$$x^2 + \frac{4}{x^2} + 4 = 21 + 4$$

$$\left(x + \frac{2}{x}\right)^2 = 25$$



96. $x^4 + x^{-4} = 1154, (x > 0)$, then the value of $2(x - 3)^2$ is:

$x^4 + x^{-4} = 1154, (x > 0)$, तो $2(x - 3)^2$ का मान क्या है?

[A] 16

[C] 20

[B] 12

[D] 15

$$= 2 \cdot (x^2 - 6x + 9)$$

$$x^4 + \frac{1}{x^4} = 1154$$

$$x^2 + \frac{1}{x^2} = \sqrt{1156} = 34$$

$$x + \frac{1}{x} = 6 \Rightarrow x(x - 6) = -1$$

$$= 2 \cdot [x \cdot (x - 6) + 9]$$
$$= 16$$

97. If $x^4 + x^{-4} = 119$, ($x > 0$), then the value of $(2x - 3)^2$ is:

यदि $x^4 + x^{-4} = 119$ है, ($x > 0$) तो $(2x - 3)^2$ का मान है:

[A] 12

[B] 13

[C] 15

[D] 14

$$= 4x^2 - 12x + 9$$

$$= 4x \cdot (x - 3) + 9$$

$$= 4 \times 1 + 9$$

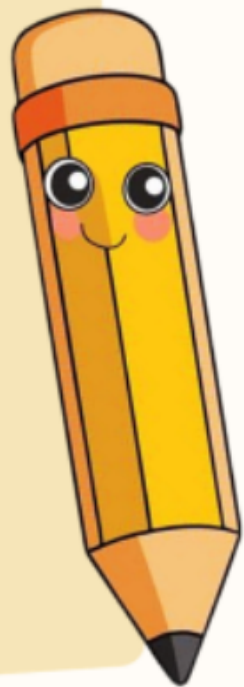
$$= 13$$

$$x^4 + \frac{1}{x^4} = 119$$

$$x^2 + \frac{1}{x^2} = \sqrt{119} = 11$$

$$x - \frac{1}{x} = \sqrt{11-9} = 3 \Rightarrow x \cdot (x-3) = +1$$

If, $x + \frac{1}{x} = k$



तो, $x - \frac{1}{x} = \pm \sqrt{k^2 - 4}$

If, $x - \frac{1}{x} = k$

तो, $x + \frac{1}{x} = \pm \sqrt{k^2 + 4}$

if, $x + \frac{1}{x} = k$

तो $x - \frac{1}{x} = \pm \sqrt{k^2 - 4}$

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

$$\left(x - \frac{1}{x}\right)^2 = \left(x + \frac{1}{x}\right)^2 - 4 \cancel{x} \cancel{x} \frac{1}{\cancel{x}}$$

$$\left(x - \frac{1}{x}\right)^2 = k^2 - 4$$

तो $z + \frac{1}{z} = 11$

तो $z - \frac{1}{z} = \pm \sqrt{11^2 - 4}$
 $= \pm 3\sqrt{13}$

if, $z \cdot (z - 8) = 1$
 $\neq$

$$z \cdot (z - \text{पफ्लू}) = -1$$

तो $\text{पफ्लू} = \pm \sqrt{8^2 + 4} = \pm 2\sqrt{17}$

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

$$z + \frac{1}{z} = \text{पफ्लू}$$

98. If $\frac{m^{117}}{n^{109}} - \frac{n^{109}}{m^{117}} = 9$, then find $\frac{m^{117}}{n^{109}} + \frac{n^{109}}{m^{117}}$?

यदि $\frac{m^{117}}{n^{109}} - \frac{n^{109}}{m^{117}} = 9$ है, तो $\frac{m^{117}}{n^{109}} + \frac{n^{109}}{m^{117}}$ ज्ञात कीजिये?

[A] $\sqrt{90}$

[B] $\sqrt{85}$

[C] $\sqrt{10}$

[D] $\sqrt{82}$

$$x - \frac{1}{x} = 9$$

$$x + \frac{1}{x} = \sqrt{9^2 + 4}$$

99. If $a = \frac{1}{a-5}$ ($a > 0$) then the value of $a + \frac{1}{a}$ is

यदि $a = \frac{1}{a-5}$ ($a > 0$) है, तो $a + \frac{1}{a}$ का मान क्या होगा?

☒ [A] $\sqrt{29}$

☐ [C] $-\sqrt{29}$

[B] $2\sqrt{29}$

[D] $\sqrt{21}$

$\sqrt{5^2 + 4}$

$$a \cdot (a-5) = 1$$

$$a - \frac{1}{a} = 5$$

100. Given, $x + \frac{1}{x} = 5$, then determine the value of $\frac{2x}{x^2-1}$.

दिया गया है, $x + \frac{1}{x} = 5$, तो $\frac{2x}{x^2-1}$ का मान ज्ञात कीजिए.

(SSC CGL 2025 PRE)

[A] $\frac{2\sqrt{21}}{21}$

[C] $\frac{7\sqrt{21}}{25}$

[B] $\frac{2\sqrt{21}}{25}$

[D] $\frac{9\sqrt{21}}{29}$

$$\frac{2}{x - \frac{1}{x}} = \frac{2\sqrt{x}}{\sqrt{x} \times \sqrt{x}} = \frac{2\sqrt{x}}{x}$$

101. If $\frac{a-1}{\sqrt{a}} = 5$, then find $\frac{a+1}{\sqrt{a}}$?

यदि $\frac{a-1}{\sqrt{a}} = 5$ है, तो $\frac{a+1}{\sqrt{a}}$ ज्ञात कीजिए?

[A] $\sqrt{29}$

[B] 21

[C] $\sqrt{21}$

[D] $\sqrt{27}$

$$\sqrt{a} - \frac{1}{\sqrt{a}} = 5$$

$$\sqrt{a} + \frac{1}{\sqrt{a}} = \sqrt{5^2 + 4}$$

102. If $\frac{\dot{A}+\dot{B}}{\sqrt{AB}} = 10\sqrt{2}$, then $\frac{A-B}{\sqrt{AB}} = ?$

[A] 12

[C] 13

✓ [B] 14

[D] $9\sqrt{2}$

$$\sqrt{\frac{A}{B}} + \sqrt{\frac{B}{A}} = 10\sqrt{2}$$

$$\begin{aligned}\sqrt{\frac{A}{B}} - \sqrt{\frac{B}{A}} &= \sqrt{(10\sqrt{2})^2 - 4} \\ &= 14\end{aligned}$$

103. If $x + \frac{1}{x+7} = 0$, then $x - \frac{1}{x+7} = ?$

यदि $x + \frac{1}{(x+7)} = 0$, हो तो, $x - \frac{1}{x+7} = ?$ $3\sqrt{5}-7$

[A] $3\sqrt{5}-5$

[B] $3\sqrt{5}-7$

[C] $3\sqrt{7}-5$

[D] $3\sqrt{7}-7$

$$(x+7) + \frac{1}{(x+7)} = 7$$

$$(x+7) - \frac{1}{(x+7)} = 3\sqrt{5}$$

104. If $\sec x - \cos x = 4$, then what will be the value of $\frac{(1+\cos^2 x)}{\cos x}$?

यदि $\sec x - \cos x = 4$ है, तो $\frac{(1+\cos^2 x)}{\cos x}$ का मान क्या होगा?

[A] $\frac{9}{4}$

[B] $\frac{1}{4}$

[C] $2\sqrt{5}$

[D] $\sqrt{5}$

$$\sec x - \frac{1}{\sec x} = 4$$

$$\sec x + \frac{1}{\sec x} = \sqrt{4^2 + 4} = 2\sqrt{5}$$

$$\cos x \times \sec x = 1$$

105. If $x > 1$ and $x^2 + \frac{1}{x^2} = 2\sqrt{5}$ what is the value of $x^4 - \frac{1}{x^4}$?

यदि $x > 1$ और $x^2 + \frac{1}{x^2} = 2\sqrt{5}$, $(x^2)^2 - \frac{1}{(x^2)^2}$ का मान क्या है?

(SSC SELECTION POST XI 2023)

[A] $4\sqrt{5}$

[B] $4\sqrt{30}$

☒ [C] $8\sqrt{5}$

[D] $8\sqrt{6}$

$$\begin{aligned} &= \left(x^2 + \frac{1}{x^2}\right) \cdot \left(x^2 - \frac{1}{x^2}\right) \\ &\quad \downarrow \qquad \qquad \downarrow \\ &2\sqrt{5} \times \sqrt{30-4} \\ &= 8\sqrt{5} \end{aligned}$$

106. If $x^2 - 7x + 1 = 0$, and $0 < x < 1$, what is the value of $x^2 - \frac{1}{x^2}$?

यदि $x^2 - 7x + 1 = 0$ और $0 < x < 1$ है, तो $x^2 - \frac{1}{x^2}$ का मान क्या होगा?

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[A] ~~$21\sqrt{5}$~~

[C] ~~$28\sqrt{5}$~~

[B] $-21\sqrt{5}$

[D] ~~$-28\sqrt{5}$~~

$$x + \frac{1}{x} = 7$$

$$\left(x + \frac{1}{x}\right) \cdot \left(x - \frac{1}{x}\right)$$

$$7 \times -\sqrt{7^2 - 4}$$

$$7x - 3\sqrt{5} \\ = -21\sqrt{5}$$

if, $x > 1$

तो $x > \frac{1}{x}$

$$5 > \frac{1}{5}$$

$$5 > .2$$

if, $0 < x < 1$

तो $x < \frac{1}{x}$

$$.25$$

$$.25 < \frac{1}{.25}$$

$$.25 < 4$$

$$\frac{1}{\frac{1}{4}} = 4$$

107. If $x^2 + \frac{1}{x^2} = 6$, and $0 < x < 1$, what is the value of $x^4 - \frac{1}{x^4}$?

यदि $x^2 + \frac{1}{x^2} = 6$, और $0 < x < 1$, तो $x^4 - \frac{1}{x^4}$ का मान क्या है?

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[A] $24\sqrt{2}$

[B] $-24\sqrt{2}$

[C] $-12\sqrt{10}$

[D] $12\sqrt{10}$

$$\begin{aligned} & \left(x^2 + \frac{1}{x^2}\right) \cdot \left(x^2 - \frac{1}{x^2}\right) \\ & \quad \downarrow \quad \quad \downarrow \\ & 6 \times \quad \quad \downarrow \sqrt{6^2 - 4} \\ & = 6 \times -4\sqrt{2} \end{aligned}$$



if, $5x + \frac{7}{4x} = 12$

तो $5x - \frac{7}{4x} = \pm \sqrt{12^2 - 4 \times 5 \times \frac{7}{4}}$
 $= \pm \sqrt{109}$

108. If $3x - \frac{1}{4x} = 6$, then $4x + \frac{1}{3x} = ?$

$\frac{4}{3} \times (3x - \frac{1}{4x} = 6)$, हो तो, $4x + \frac{1}{3x} = ?$ $\sqrt{8^2 + 4 \times 4 \times \frac{1}{3}}$

[A] $2\sqrt{17}$

[C] $2\sqrt{15}$

[B] $\frac{4\sqrt{13}}{\sqrt{3}} = \sqrt{16(4 + \frac{1}{3})}$

[D] $\frac{4\sqrt{17}}{\sqrt{3}} = 4\sqrt{\frac{13}{3}}$

$4x - \frac{1}{3x} = 8$

109. If $2x - \frac{5}{9x} = 3$, then $36x^2 - \frac{25}{9x^2} = ?$

यदि $2x - \frac{5}{9x} = 3$ हो, तो $36x^2 - \frac{25}{9x^2} = ?$

[A] 99

[C] 123

[B] 119

[D] 101

$$6x - \frac{5}{3x} = 9$$

$$\left(6x + \frac{5}{3x}\right) \cdot \left(6x - \frac{5}{3x}\right)$$

$$\sqrt{81 + 4 \times \cancel{6} \times \frac{5}{\cancel{3}}} \times 9$$

$$= 11 \times 9$$