

If, $x + \frac{1}{x} = \sqrt{t}$

तो $x^3 + \frac{1}{x^3} = (t - 3)\sqrt{t}$

if, $x + \frac{1}{x} = \sqrt{19}$

तो $x^3 + \frac{1}{x^3} = 16\sqrt{19}$

If, $x - \frac{1}{x} = \sqrt{t}$

तो $x^3 - \frac{1}{x^3} = (t + 3)\sqrt{t}$

if, $x - \frac{1}{x} = 7$

$\Rightarrow x - \frac{1}{x} = \sqrt{7^2 - 4} = \sqrt{45}$

तो $x^3 - \frac{1}{x^3} = 48\sqrt{45} = 144\sqrt{5}$ ✓



132. If $\frac{6x}{2x^2+5x-2} = 1, x > 0$, then the value of $x^3 + \frac{1}{x^3}$ is:

यदि $\frac{6x}{2x^2+5x-2} = 1, x > 0$ है, तो $x^3 + \frac{1}{x^3}$ का मूल्य है-

[A] $\frac{3}{8}\sqrt{17}$

[C] $\frac{5\sqrt{17}}{16}$

[B] $\frac{5\sqrt{17}}{8}$

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

$\left(\frac{17}{4}-3\right)\sqrt{\frac{17}{4}}$
 $= \frac{5\sqrt{17}}{8}$

$$2x^2 + 5x - 2 = 6x$$

$$2x^2 - 2 = x$$

$$x \cdot (x-1) = x$$

$$x - \frac{1}{x} = \frac{1}{2} \Rightarrow x + \frac{1}{x} = \sqrt{\frac{1}{4} + 1} = \sqrt{\frac{17}{4}}$$



133. Given that $x^8 - 34x^4 + 1 = 0, x > 0$. What is the value of $(x^3 + x^{-3})$?

दिया गया है $x^8 - 34x^4 + 1 = 0, x > 0$, तो $(x^3 + x^{-3})$ का मान ज्ञात कीजिए।

☒ [A] $5\sqrt{8}$

$$x^4$$

[B] $6\sqrt{6}$

[C] $5\sqrt{6}$

[D] $6\sqrt{8}$

$$x^3 + \frac{1}{x^3} = 5\sqrt{8}$$

$$x^4 + \frac{1}{x^4} = 34$$

$$x^2 + \frac{1}{x^2} = 6$$

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

134. If $\frac{1}{a^4} + a^4 = 50, a > 0$, then find the value of $a^3 + \frac{1}{a^3}$?

यदि $\frac{1}{a^4} + a^4 = 50, a > 0$, है तो $a^3 + \frac{1}{a^3}$ का मान क्या है?

[A] $\sqrt{2(1 + \sqrt{13})} \cdot (-1 - 2\sqrt{13})$ ✗

[B] $\sqrt{2(1 - \sqrt{13})} (-1 + 2\sqrt{13})$ ✗

[C] $\sqrt{2(1 + \sqrt{13})} \oplus (-1 + 2\sqrt{13})$ ✗

[D] $\sqrt{2(1 + \sqrt{13})} \cdot (-1 + 2\sqrt{13})$ ✓

$a^4 + \frac{1}{a^4} = 50$

$= \sqrt{52}$

$a + \frac{1}{a} = \sqrt{\sqrt{52} + 2}$

$= \sqrt{6\sqrt{13} + 2}$

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

, $\sqrt{x}$



तो $x^3 - \frac{1}{x^3} = k^3 + 3k$, $(x+3)\sqrt{x}$



135. If $\frac{x^2-1}{x} = 4$, then find the value of $\frac{x^6-1}{x^3}$.

यदि $\frac{x^2-1}{x} = 4$, है, तो $\frac{x^6-1}{x^3}$ का मान ज्ञात कीजिए।

RRB Group-D 2024

[A] 80

[B] 66

☒ [C] 76

[D] 82

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

$$x^3 - \frac{1}{x^3} = 4^3 + 3 \times 4 = 76$$



136. If $\frac{x^2}{x^4+1} = \frac{1}{83}$, then find $x^3 - \frac{1}{x^3}$?

यदि $\frac{x^2}{x^4+1} = \frac{1}{83}$, तो $x^3 - \frac{1}{x^3}$ ज्ञात कीजिए?

[A] 718

[C] 702

$\downarrow$
 $9^3 + 3 \times 9$

[B] 756

[D] 765

$$\frac{x^4+1}{x^2} = \frac{83}{1}$$

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

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

137. If $x = \sqrt{10} + 3$, what is the value of $x^3 - \frac{1}{x^3}$?

यदि $x = \sqrt{10} + 3$ है, तो $x^3 - \frac{1}{x^3}$ का मान कितना है?

RRB Group-D 2024

[A] 314

[C] 304

[B] 284

[D] 234

$\rightarrow 6^3 + 3 \times 6$

$$x = \sqrt{10} + 3$$

$$\frac{1}{x} = \sqrt{10} - 3$$

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

138. If $x^4 - 83x^2 + 1 = 0$ and $x > 0$, find the value of $\sqrt{x^3 - x^{-3} + 28}$.

यदि $x^4 - 83x^2 + 1 = 0$ और $x > 0$ है, तो $\sqrt{x^3 - x^{-3} + 28}$ का मान ज्ञात कीजिए।

RRB NTPC Graduate Level CBT-1 2025

[A] 29

[B] 27

[C] 28

[B] 26



139. If $x(x - 5) = -1$, then the value of $x^3(x^3 - 110) = ?$

यदि $x(x - 5) = -1$ है, तो $x^3(x^3 - 110)$ का मान ज्ञात करें।

[A] 0

[C] 1

✓ [B] -1

[D] 2

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

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

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

$$x^3(x^3 - 110) = -1$$

140. If $x(x - 3) = -1$, then find $x^5(x^2 - 7)(x^3 - 18)$?

यदि $x(x - 3) = -1$ है, तो $x^5(x^2 - 7)(x^3 - 18)$ ज्ञात कीजिये?

[A] 0

[B] +1

[C] 2

[D] -1

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

~~$x^2 + \frac{1}{x^2} = 7$~~

~~$x^3 + \frac{1}{x^3} = 18$~~

~~$x^2(x^2 - 7) \times x^3(x^3 - 18)$~~

~~-1×-1~~

~~$= 1$~~



#



141. If $\left(0.4x + \frac{1}{x}\right) = 5$, what is the value of $\left(0.064x^3 + \frac{1}{x^3}\right)$?

यदि $\left(0.4x + \frac{1}{x}\right) = 5$ है, तो $\left(0.064x^3 + \frac{1}{x^3}\right)$ का मान ज्ञात करें।

[A] 125

[B] 110

[C] 119

[D] 105

$$\begin{aligned} (.4x)^3 + \left(\frac{1}{x}\right)^3 &= 5^3 - 3 \times 5 \times .4 \\ &= 125 - 6 \end{aligned}$$

142. If $3x + \frac{1}{2x} = 5$, then $8x^3 + \frac{1}{27x^3} = ?$

यदि $\left(3x + \frac{1}{2x} = 5\right)$ हो तो $8x^3 + \frac{1}{27x^3} = ?$

[A] $\frac{946}{27}$

[B] $\frac{820}{27}$

[C] $\frac{730}{27}$

[D] $\frac{973}{27}$

$2x + \frac{1}{2x} = \frac{10}{3}$

$(2x)^3 + \frac{1}{(2x)^3} = \frac{1000}{27} - 3 \times \frac{10}{3} \times 2x \times \frac{1}{3}$
 $= \frac{1000 - 180}{27}$

143. If $\left(3x^2 + \frac{1}{2x^2}\right) = 2.5$, what is the value of $\left(27x^6 + \frac{1}{8x^6}\right)$?

यदि $\left(3x^2 + \frac{1}{2x^2}\right) = 2.5$ है, तो $\left(27x^6 + \frac{1}{8x^6}\right)$ का मान क्या होगा?

[A] ~~5.125~~

[C] ~~3.325~~

[B] ~~6.275~~

[D] 4.375

$$= 2.5^3 - 3 \times 2.5 \times 3 \times \frac{1}{2}$$

$$= 2.5 \times (6.25 - 4.5)$$

$$= 2.5 \times 1.75$$

144. If $x + \frac{1}{16x} = 3$, then the value of $16x^3 + \frac{1}{256x^3}$ is:

यदि $x + \frac{1}{16x} = 3$, तो $16x^3 + \frac{1}{256x^3}$ मान है:

RRB JE 2025 (RRB NTPC GRADUATE LEVEL CBT-1 2026)

☒ [A] 423

[B] 414

[C] 432

[D] 441

$$16x \left(x^3 + \frac{1}{(16x)^3} \right) = 3^3 - 3 \times 3 \times \frac{1}{16}$$

$$= 16 \times 27 - 9$$

$$= 432 - 9 = 423$$

145. If $x + \frac{1}{15x} = 3$ then the value of $9x^3 + \frac{1}{375x^3}$ will be:

यदि $x + \frac{1}{15x} = 3$ है, तो $9x^3 + \frac{1}{375x^3}$ का मान ज्ञात करें।

[A] 237.6

[B] 376.2

[C] 273.6

[D] 367.2

$$9x \left(x^3 + \frac{1}{(15x)^3} \right) = 3^3 - 3 \times 3 \times \frac{1}{15}$$

$$243 - 5.4$$



146. If $\frac{x^2-1}{x} = 8$, then what is the value of $\frac{x^6-1}{x^3} = ?$

यदि $\frac{x^2-1}{x} = 8$, तो $\frac{x^6-1}{x^3}$ का मान क्या है?

SSC CHSL TIER – I 2022

[A] 496

[C] 512

[B] 536

[D] 488

$$8^3 + 3 \times 8$$

147. If $\left(x - \frac{1}{x}\right) = \frac{7}{3}$, what is the value of $\left(x^3 - \frac{1}{x^3}\right)$?

यदि $\left(x - \frac{1}{x}\right) = \frac{7}{3}$ है, तो $\left(x^3 - \frac{1}{x^3}\right)$ का मान ज्ञात कीजिए?

[A] $19\frac{20}{27}$ ✗

[C] $19\frac{7}{9}$ ✗

[B] $19\frac{19}{27}$ ✓ = $19 + \frac{19}{27}$

[D] $19\frac{2}{3}$ ✗

$\rightarrow x \cdot (x^2 + 3)$

$= \frac{7}{3} \times \left(\frac{49}{9} + 3\right)$

$= \frac{7}{3} \times \frac{76}{9}$

148. If $x\left(3 - \frac{2}{x}\right) = \frac{3}{x}$, then the value of $x^3 - \frac{1}{x^3}$ is equal to:

यदि $x\left(3 - \frac{2}{x}\right) = \frac{3}{x}$ है, तो $x^3 - \frac{1}{x^3}$ का मान ज्ञात कीजिए।

[A] $\frac{61}{27}$

[C] $\frac{58}{27}$

[B] $\frac{52}{27}$

☒ [D] $\frac{62}{27}$

$$\frac{2}{3}\left(\frac{4}{9} + 3\right)$$

$$= \frac{2}{3} \times \frac{31}{9}$$

$$3x - 2 = \frac{3}{x}$$

$$3x - \frac{3}{x} = 2$$

$$x - \frac{1}{x} = \frac{2}{3}$$

149. If $y + \frac{1}{y} = 11$, then the value of $y^3 - \frac{1}{y^3}$ is:

यदि $y + \frac{1}{y} = 11$ है, तो $y^3 - \frac{1}{y^3}$ का मान ज्ञात करें।

(SSC CGL PRE 2022)

[A] $345\sqrt{13}$

[C] $352\sqrt{13}$

☒ [B] $360\sqrt{13}$

[D] $368\sqrt{13}$

Ans: $\sqrt{117}$

$$y - \frac{1}{y} = \sqrt{11^2 - 4} = \sqrt{117}$$

150. If $a - \frac{1}{a-5} = 18$, then the value of $(a-5)^3 - \frac{1}{(a-5)^3}$ is:

यदि $a - \frac{1}{(a-5)} = 18$ है, तो $(a-5)^3 - \frac{1}{(a-5)^3}$ का मान क्या होगा?

[A] 2236

[B] 2168

[C] 2239

[D] 2201

$$\begin{aligned} &\rightarrow 13^3 + 3 \times 13 \\ &= 2197 + 39 \end{aligned}$$

$$(a-5) - \frac{1}{(a-5)} = 13$$

151. If $\left(x^2 + \frac{1}{x^2}\right) = 18$ and $x > 1$, what is the value of $\left(x^3 - \frac{1}{x^3}\right)$?

यदि $\left(x^2 + \frac{1}{x^2}\right) = 18$ और $x > 1$, तो $\left(x^3 - \frac{1}{x^3}\right)$ का मान क्या है?

(SSC SELECTION POST XI 2023)

[A] 52

[B] 76

[C] 80

[D] 64

$4^3 + 3 \times 4$

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

152. If $x^a + \frac{1}{x^a} = 2\sqrt{10}$, then find the value of $x^{3a} - \frac{1}{x^{3a}}$?

यदि $x^a + \frac{1}{x^a} = 2\sqrt{10}$ है, तो $x^{3a} - \frac{1}{x^{3a}}$ का मान ज्ञात कीजिये?

[A] 210

☒ [B] 234

[C] 216

[D] 198

$$x^a - \frac{1}{x^a} = \sqrt{(2\sqrt{10})^2 - 4} \\ = 6$$

153. If $a^2 + \frac{1}{a^2} = \frac{7}{3}$, then what is the value of $a^3 - \frac{1}{a^3}$?

यदि $a^2 + \frac{1}{a^2} = \frac{7}{3}$, तो $a^3 - \frac{1}{a^3}$ का मान क्या है?

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

[B] $10/3\sqrt{3}$

[C] $7/3\sqrt{3}$

[D] $8/3\sqrt{3}$

(10/3)√3

54. If $\frac{4}{3}\left(x^2 + \frac{1}{x^2}\right) = 110\frac{2}{3}$, then find $\frac{1}{9}\left(x^3 - \frac{1}{x^3}\right)$, where $x > 0$

यदि $\frac{4}{3}\left(x^2 + \frac{1}{x^2}\right) = 110\frac{2}{3}$ है, तो $\frac{1}{9}\left(x^3 - \frac{1}{x^3}\right)$ का मान ज्ञात करें, जहाँ $x > 0$ है।

[A] 84

[B] 85

$$= \frac{1}{9}x(9^3 + 3 \times 9)$$

[C] 74

[D] 76

$$= 81 + 3$$

$$\cancel{\frac{4}{3}}\left(x^2 + \frac{1}{x^2}\right) = \frac{\cancel{332}}{\cancel{3}}$$

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

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

155. If $p^4 = 4354 - \frac{1}{p^4}$ then the value of $p^3 - \frac{1}{p^3}$ can be:

यदि $p^4 = 4354 - \frac{1}{p^4}$ है, तो $p^3 - \frac{1}{p^3}$ का मान ----- है।

[A] 536

[C] 416

[B] 436

[D] 516

$\rightarrow 8^3 + 3 \times 8$

$$p^4 + \frac{1}{p^4} = 4354$$

$$p^2 + \frac{1}{p^2} = \sqrt{4356} = 66$$

$$p - \frac{1}{p} = \sqrt{64} = 8$$

156. If $x^2 - 5\sqrt{5}x + 1 = 0$ & $x > 0$, then find $x^3 - \frac{1}{x^3}$?

यदि $x^2 - 5\sqrt{5}x + 1 = 0$ & $x > 0$, तो $x^3 - \frac{1}{x^3}$ ज्ञात करें?

[A] 1331

[C] 1244

✓ [B] 1364

[D] 1364

$\rightarrow \frac{1}{x^3} = \frac{1}{x^3} = \frac{1}{x^3}$

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

$$x - \frac{1}{x} = \sqrt{125 - 4} = 11$$

157. If $g = (2 - \sqrt{3})$, then find $\left(g^3 - \frac{1}{g^3}\right)$?

यदि $g = (2 - \sqrt{3})$, तो $\left(g^3 - \frac{1}{g^3}\right)$ ज्ञात करें?

☒ [A] $-30\sqrt{3}$

☐ [C] $30\sqrt{3}$

☐ [B] 52

☐ [D] -52

$$\begin{aligned} g &= 2 - \sqrt{3} \\ \frac{1}{g} &= 2 + \sqrt{3} \end{aligned}$$

$$g - \frac{1}{g} = -2\sqrt{3}$$

$(-2\sqrt{3})^3 + 3 \times (-2\sqrt{3})$



158. If $6x - \frac{4}{9x} = 1$, then $729x^3 - \frac{8}{27x^3} = ?$

यदि $(6x - \frac{4}{9x} = 1)$ हो, तो $729x^3 - \frac{8}{27x^3} = ?$

[A] $\frac{41}{4}$

[B] $\frac{99}{8}$

[C] $\frac{243}{8}$

[D] $\frac{195}{8}$

$$9x - \frac{2}{3x} = \frac{3}{2}$$

$$\begin{aligned} (9x)^3 - \left(\frac{2}{3x}\right)^3 &= \frac{27}{8} + 3 \times \frac{3}{2} \times 9 \times \frac{2}{3} \\ &= \frac{243}{8} \end{aligned}$$

159. If $2x - \frac{1}{x} = 3$, $x \neq 0$, then simplify $8x^6 - 25x^3 - 1$.

यदि $2x - \frac{1}{x} = 3$, $x \neq 0$ हो तो $8x^6 - 25x^3 - 1$ का मान क्या होगा?

[A] $20x^3$

[B] $18x^3$

$= 45x^3 - 25x^3$

[C] $27x^3$

[D] $34x^3$

x^3

$$8x^3 - \frac{1}{x^3} = 45$$

$$8x^6 - 1 = 45x^3$$



160. If $x^2 - 5x + 1 = 0$, then the value of $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ is:

यदि $x^2 - 5x + 1 = 0$ है, तो $\left(x^4 + \frac{1}{x^2}\right) \div (x^2 + 1)$ का मान ज्ञात करें।

[A] 21

✓ [B] 22

[C] 25

[D] 24

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

$$\frac{x^4 + \frac{1}{x^2}}{x^2 + \frac{1}{x}}$$

$$= \frac{x^3 + \frac{1}{x^3}}{x + \frac{1}{x}} = \frac{110}{5}$$

161. If $x^2 - 4x - 3 = 0$, then what is the value of $\frac{\left(x^4 - \frac{27}{x^2}\right)}{(x^2 + 4x - 3)}$?

यदि $x^2 - 4x - 3 = 0$ है, तो $\frac{\left(x^4 - \frac{27}{x^2}\right)}{(x^2 + 4x - 3)}$ का मान क्या है?

- [A] $9\frac{1}{4}$
[C] $9\frac{1}{8}$

- [B] $10\frac{1}{2}$
[D] $12\frac{1}{2}$

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

$$\frac{x^3 - \frac{27}{x}}{x + 4 - \frac{3}{x}} = \frac{4^3 + 3 \times 4 \times 3}{8} = \frac{100}{8}$$

162. If $x - \frac{1}{x} = 5, x \neq 0$, then what is the value of $\frac{x^6 + 3x^3 - 1}{x^6 - 8x^3 - 1}$?

$x - \frac{1}{x} = 5, x \neq 0$ है, तो $\frac{x^6 + 3x^3 - 1}{x^6 - 8x^3 - 1}$ का मान ज्ञात कीजिए।

[A] $\frac{13}{12}$

[B] $\frac{11}{13}$

[C] $\frac{3}{8}$

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

$$x^3 - \frac{1}{x^3} = 5^3 + 3 \times 5$$
$$= 140$$

$$\frac{x^3 + 3 - \frac{1}{x^3}}{x^3 - 8 - \frac{1}{x^3}} = \frac{143}{139}$$
$$= \frac{13}{12}$$

163. If $x^2 - 3x - 1 = 0$, then the value of $(x^2 + 8x - 1)(x^3 + x^{-1})^{-1}$ is:

यदि $x^2 - 3x - 1 = 0$ है, तो $(x^2 + 8x - 1)(x^3 + x^{-1})^{-1}$ का मान है:

[A] $\frac{3}{8}$

[B] 8

[C] 1

[D] 3

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

$$(x^3 + \frac{1}{x})^{-1} = \left(\frac{x^4 + 1}{x} \right)^{-1}$$

$$(x^2 + 8x - 1) \times \frac{x}{x^4 + 1}$$

$$= \frac{11x^2}{x^4 + 1} = \frac{11}{x^2 + \frac{1}{x^2}} = \frac{11}{\cancel{11}}$$

164. If $x - \frac{1}{x} = 3$, then what is the value of $\frac{(2x^4 + 3x^3 + 13x^2 - 3x + 2)}{(3x^4 + 3)}$?

यदि $x - \frac{1}{x} = 3$ है, तो $\frac{(2x^4 + 3x^3 + 13x^2 - 3x + 2)}{(3x^4 + 3)}$ का मान क्या है?

[A] $\frac{1}{3}$

[B] $\frac{2}{3}$

[C] $\frac{4}{3}$

[D] $\frac{5}{3}$

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

$x^2 + 9 + 13$

$$\frac{x^4 + 3x^3 + 13x^2 - 3x + 2}{3 \cdot (x^4 + \frac{1}{x^2})} = \frac{44}{33}$$