192. If $x = \sqrt{3} - \sqrt{2}$, then the value of $x^3 - x^{-3}$ is:

HW

यदि $x = \sqrt{3} - \sqrt{2}$, तो $x^3 - x^{-3}$ का मान है:

a) $22\sqrt{3}$ b) $-22\sqrt{2}$

c) $22\sqrt{2}$ d) $-22\sqrt{3}$

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

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

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

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

$= -16\sqrt{2} - 6\sqrt{2}$

$= -22\sqrt{2}$

$$x = \sqrt{\frac{2}{2} \times \frac{3-\sqrt{5}}{2}}$$

$$= \sqrt{\frac{6-2\sqrt{5}}{4}} \longrightarrow 5 \times 1$$

$$= \frac{\sqrt{5}-1}{2}$$

$$\frac{1}{x} = \frac{2}{\sqrt{5}-1} = \frac{2(\sqrt{5}+1)}{4 \cdot 2}$$

193. HW

If $x = \sqrt{\frac{3-\sqrt{5}}{2}}$ then find the value of $x^6 + \frac{1}{x^6}$.

यदि $x = \sqrt{\frac{3-\sqrt{5}}{2}}$ है तो $x^6 + \frac{1}{x^6}$ का मान ज्ञात कीजिये |

a) 198 b) 27 c) 36 d) 18

$$x + \frac{1}{x} = \frac{\sqrt{5}-1+\sqrt{5}+1}{2} = \sqrt{5}$$

$$x^2 + \frac{1}{x^2} = 5-2 = 3$$

$$x^3 + \frac{1}{x^3} = 27-9 = 18$$

194. If $a - \frac{1}{a-3} = 6$, then $(a-3)^3 - \frac{1}{(a-3)^3} = ?$

अगर $a - \frac{1}{a-3} = 6$ है तो $(a-3)^3 - \frac{1}{(a-3)^3} = ?$

a) 27 b) 18 c) 36 d) 25

$(a-3) - \frac{1}{(a-3)} = 6-3 = 3$

3x

$27+9=36$

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

यदि $x^2 + \frac{1}{x^2+1} = 6$ है, तो $(x^2+1)^2 + \frac{1}{(x^2+1)^2}$ का मान ज्ञात करें ।

a) 27 b) 23 c) 47 d) 51

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

$2x$

$4a-2$

196. If $a^2 + b^2 = 5ab$, the value of $\frac{a^2}{b^2} + \frac{b^2}{a^2}$ is

अगर $a^2 + b^2 = 5ab$ है तो $\frac{a^2}{b^2} + \frac{b^2}{a^2}$ का मान:

a) 32 b) 27 c) 23 d) -23

$\frac{a^2}{ab} + \frac{b^2}{ab} = 5$

$\frac{a}{b} + \frac{b}{a} = 5$

2x

$\left(\frac{a}{b}\right)^2 + \left(\frac{b}{a}\right)^2 = 5^2 - 2$

$= 23$

197. If $2x + \frac{2}{x} = 3$, then the value of $x^3 + \frac{1}{x^3} + 2$ is

अगर $2x + \frac{2}{x} = 3$ है तो $x^3 + \frac{1}{x^3} + 2$ का मान:

a) $-\frac{9}{8}$ b) $-\frac{25}{8}$ c) $\frac{7}{8}$ d) 11

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

$\frac{27}{8} - \frac{9}{2} + 2$

$= \frac{27 - 36 + 16}{8} = \frac{7}{8}$

198. If $4a - \frac{4}{a} + 3 = 0$, then the value of $a^3 - \frac{1}{a^3} + 3 = ?$

अगर $4a - \frac{4}{a} + 3 = 0$ है तो $a^3 - \frac{1}{a^3} + 3 = ?$

a) $\frac{7}{16}$ b) $\frac{3}{16}$ c) $\frac{21}{64}$ d) $\frac{21}{16}$

-3

$a - \frac{1}{a} = \frac{-3}{4}$

$\frac{-27}{64} - \frac{9}{4} + 3$

$= \frac{-27-144+192}{64} = \frac{21}{64}$

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

अगर $x\left(3-\frac{2}{x}\right)=\frac{3}{x}$ है तो $x^2+\frac{1}{x^2}$ का मान:

a) $\frac{19}{9}$ b) $\frac{22}{9}$ c) $\frac{28}{9}$ d) $\frac{-14}{9}$

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

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

$\frac{4}{9}+2$

200. If $x + \frac{1}{4x} = \frac{3}{2}$ then $8x^3 + \frac{1}{8x^3} = ?$

अगर $x + \frac{1}{4x} = \frac{3}{2}$ है तो $8x^3 + \frac{1}{8x^3} = ?$

a) 18 b) 36 c) 24 d) 16

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

$(2x)^3 + \frac{1}{(2x)^3}$

$27 - 9 = 18$

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

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

a) 423 b) 441 c) 432 d) 414

$$4x + \frac{1}{4x} = 12$$

$$64x^3 + \frac{1}{64x^3} = 1728 - 36 = 1692$$

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202. If $2p + \frac{1}{p} = 4$, then the value of $p^3 + \frac{1}{8p^3} = ?$

अगर $2p + \frac{1}{p} = 4$ है तो $p^3 + \frac{1}{8p^3} = ?$

a) 4 b) 5 c) 8 d) 15

$P + \frac{1}{2P} = 2$

$(P)^3 + \frac{1}{(2P)^3} = 8 - 3 \cdot P \times \frac{1}{2P} \times 2$

$= 5$

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

203. If $4b^2 + \frac{1}{b^2} = 2$, then the value of $8b^3 + \frac{1}{b^3} = ?$

अगर $4b^2 + \frac{1}{b^2} = 2$ है तो $8b^3 + \frac{1}{b^3} = ?$

a) 0 b) 1 c) 2 d) -4

$2 \times 2b \times \frac{1}{b}$

$(2b)^2 + \frac{1}{(b)^2} + 4 = 2 + 4$

$\left(2b + \frac{1}{b}\right)^2 = \sqrt{6}$

$(2b)^3 + \frac{1}{(b)^3} = 6\sqrt{6} - 3 \cdot 2b \cdot \frac{1}{b} \sqrt{6}$

$= 0$

20. If $3x + \frac{1}{2x} = 6$, then $8x^3 + \frac{1}{27x^3} = ?$

$\frac{2}{3}$ अगर $3x + \frac{1}{2x} = 6$ है तो $8x^3 + \frac{1}{27x^3} = ?$

a) 76 b) 56 c) 52 d) 72

$2x + \frac{1}{3x} = 4$

$(2x)^3 + \frac{1}{(3x)^3} = 64 - 3 \cdot 2x \cdot \frac{1}{3x} \cdot 4$

$= 56$

25. If $x^{16} + \frac{1}{x^{16}} = 2\sqrt{10}$ then find the value of $x^{48} - \frac{1}{x^{48}}$.

यदि $x^{16} + \frac{1}{x^{16}} = 2\sqrt{10}$ है तो $x^{48} - \frac{1}{x^{48}}$ का मान ज्ञात कीजिये |

a) 216 b) 198 c) 234 d) 110

$x^{16} - \frac{1}{x^{16}} = 6$

$10 - 4$

$216 + 18$

206. If $\frac{x^{24}+1}{x^{12}} = 7$, then $\frac{x^{72}+1}{x^{36}} = ?$

यदि $\frac{x^{24}+1}{x^{12}} = 7$ है, तो $\frac{x^{72}+1}{x^{36}}$ का मान है:

a) 364 b) 322 c) 352 d) 358

$$\frac{x^{24}}{x^{12}} + \frac{1}{x^{12}} = 7$$

$$x^{12} + \frac{1}{x^{12}} = 7$$

3x

$$x^{36} + \frac{1}{x^{36}} = 343 - 21 = 322$$

207. If $t^2 - 4t + 1 = 0$, then $t^3 + \frac{1}{t^3} = ?$

अगर $t^2 - 4t + 1 = 0$ है तो $t^3 + \frac{1}{t^3} = ?$

a) 44 b) 76 c) 52 d) 64

$\frac{t^2 - 4t + 1 = 0}{t}$

$\frac{}{t}$

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

64
-12
52

208. If $a^2 - 4a - 1 = 0$, then $a^2 + \frac{1}{a^2} + 3a - \frac{3}{a} = ?$

अगर $a^2 - 4a - 1 = 0$ है तो $a^2 + \frac{1}{a^2} + 3a - \frac{3}{a} = ?$

a) 25 b) 30 c) 35 d) 40

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

$+3\left(a - \frac{1}{a}\right)$

$18 + 12 = 30$

209. If $x^2 - 3x + 1 = 0$, then the value of $2\left(x^8 + \frac{1}{x^8}\right) - 5\left(x^2 + \frac{1}{x^2}\right)$ is:

यदि $x^2 - 3x + 1 = 0$ है, तो $2\left(x^8 + \frac{1}{x^8}\right) - 5\left(x^2 + \frac{1}{x^2}\right)$ का मान ज्ञात करें|

a) 3479 b) 4379 c) 4370 d) 4279

$\div x$

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

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

$$x^4 + \frac{1}{x^4} = 49 - 2 = 47$$

$$x^8 + \frac{1}{x^8} = 47^2 - 2 = 2209 - 2 = 2207$$

$4414 - 35 = 4379$

$111 = 37 \times 3$

210. If $8x^2 + 9x + 8 = 0$, then the value of $x^3 + \frac{1}{x^3}$ is:

यदि $8x^2 + 9x + 8 = 0$ है, तो $x^3 + \frac{1}{x^3}$ का मान ज्ञात कीजिए |

a) $\frac{199}{212}$ b) $\frac{999}{212}$ c) $\frac{199}{512}$ d) $\frac{999}{512}$

$\div 8x$

$x + \frac{1}{x} = -\frac{9}{8}$

$\frac{999}{512} = \frac{27 \times 37}{512}$ (3, 9, 111)

$\frac{-729}{512} + \frac{27 \times 64}{8 \times 64}$

$= \frac{27(-27+64)}{512} = \frac{27 \times 37}{512}$

211. If $x^2 - \sqrt{7}x + 1 = 0$, then what is the value of $x^5 + \frac{1}{x^5}$?

HW

यदि $x^2 - \sqrt{7}x + 1 = 0$ है, तो $x^5 + \frac{1}{x^5}$ का मान क्या होगा?

a) $27\sqrt{7}$ b) $21\sqrt{7}$

c) $25\sqrt{7}$ d) $19\sqrt{7}$

212. If $x + \frac{1}{x} = 5$, then $\frac{2x}{3x^2-5x+3} = ?$

अगर $x + \frac{1}{x} = 5$ है तो $\frac{2x}{3x^2-5x+3} = ?$

a) 5 b) $\frac{1}{5}$ c) 3 d) $\frac{1}{3}$

$$= \frac{2}{3x - 5 + \frac{3}{x}}$$

$$= \frac{2}{3\left(x + \frac{1}{x}\right) - 5}$$

$$= \frac{2}{10} = \frac{1}{5}$$

213. If $x+\frac{1}{x}=3$, then the value of $\frac{\left(x^3+\frac{1}{x}\right)}{x^2-x+1}=?$

अगर $x+\frac{1}{x}=3$ है तो $\frac{\left(x^3+\frac{1}{x}\right)}{x^2-x+1}=?$

a) $\frac{3}{2}$ b) $\frac{5}{2}$ c) $\frac{7}{2}$ d) $\frac{11}{2}$

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

214. If $x + \frac{1}{x} = 1$, then $\frac{x^2+3x+1}{x^2+7x+1} = ?$

अगर $x + \frac{1}{x} = 1$ है तो $\frac{x^2+3x+1}{x^2+7x+1} = ?$

a) $\frac{1}{2}$ b) $\frac{3}{7}$ c) 2 d) 3

$$\frac{\left(x+\frac{1}{x}\right)+3}{\left(x+\frac{1}{x}\right)+7} = \frac{4}{8}$$

215. If $x^2 + 1 = 3x$, then the value of $\frac{x^4+x^{-2}}{x^2+5x+1}$ is:

यदि $x^2 + 1 = 3x$, तो $\frac{x^4+x^{-2}}{x^2+5x+1}$ का मान है:

a) $2\frac{1}{3}$ b) $2\frac{1}{4}$

c) $4\frac{1}{2}$ d) $3\frac{1}{2}$

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

$$\frac{\left(x^4 + \frac{1}{x^2}\right)/x}{\left(x^2+5x+1\right)/x} \leftarrow \frac{x^3+\frac{1}{x^3}}{x+\frac{1}{x}+5} \leftarrow 2\frac{1}{4} = \frac{9}{4} = \frac{18}{8}$$

216. If $x^2 - 6x + 1 = 0$, then the value of $\left(x^4 + \frac{1}{x^2}\right) \div \left(x^2 + 1\right)$ is :

यदि $x^2 - 6x + 1 = 0$ है, तो $\left(x^4 + \frac{1}{x^2}\right) \div \left(x^2 + 1\right)$ का मान है:

a)39 b)33 c)35 d)36

$\div x$

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

$$\frac{\left(x^4 + \frac{1}{x^2}\right)/x}{\left(x^2+1\right)/x}$$

$$= \frac{x^3 + \frac{1}{x^3}}{x + \frac{1}{x}} = \frac{216 - 18}{6} = 33$$

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

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

a) 1 b) $\frac{11}{9}$ c) 3 d) 8

$a^{-3} = \frac{1}{a^3}$

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

$\div -x$

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

$$\frac{(x^2+8x-1)/x}{\left(x^3+\frac{1}{x}\right)/x}$$

$$= \frac{x - \frac{1}{x} + 8}{x^2 + \frac{1}{x^2}} = \frac{11}{11} = 1$$

218. If $2x + \frac{1}{3x} = 5$, then $\frac{5x}{6x^2+20x+1} = ?$

अगर $2x + \frac{1}{3x} = 5$ है तो $\frac{5x}{6x^2+20x+1} = ?$

a) $\frac{1}{4}$ b) $\frac{1}{6}$ c) $\frac{1}{5}$ d) $\frac{1}{7}$

$6x + \frac{1}{x} = 15$

$\div x \quad \div x$

$\frac{5}{6x + \frac{1}{x} + 20} = \frac{5}{35} = \frac{1}{7}$

29. If $\frac{2p}{p^2-2p+1} = \frac{1}{4}, p \neq 0$ then $p + \frac{1}{p} = ?$

अगर $\frac{2p}{p^2-2p+1} = \frac{1}{4}, p \neq 0$ है तो $p + \frac{1}{p} = ?$

a) 4 b) 5 c) 10 d) 12

$\frac{3}{\frac{x+5}{7}} = \frac{x}{4}\frac{3}{12}$

$\frac{2}{\left(p+\frac{1}{p}\right)-2} = \frac{1}{4}\frac{2}{8}$

10

220 If $\frac{x}{x^2-2x+1} = \frac{1}{3}$, then $x^3 + \frac{1}{x^3} = ?$

अगर $\frac{x/x}{(x^2-2x+1)/x} = \frac{1}{3}$ है तो $x^3 + \frac{1}{x^3} = ?$

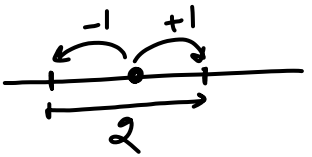
a) 140 b) 110 c) 81 d) 124

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

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

$5 \xrightarrow{3x} 125$

$125 - 15 = 110$



221. If $\frac{x^2-x+1}{x^2+x+1}=\frac{2}{3}$ then $x+\frac{1}{x}=?$

अगर $\frac{x^2-x+1}{x^2+x+1}=\frac{2}{3}$ है तो $x+\frac{1}{x}=?$

a) 4 b) -5 c) 5 d) 8

(5)

$$\frac{\left(x+\frac{1}{x}\right)-1}{\left(x+\frac{1}{x}\right)+1}=\frac{2}{3}, \frac{4}{6}$$

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

अगर $\frac{5x}{2x^2+5x+1} = \frac{1}{3}$ है तो $x + \frac{1}{2x} = ?$

a) 15 b) 10 c) 20 d) 5

$$\frac{5}{2x+\frac{1}{x}+5} = \frac{1}{3}$$

$$\frac{5}{10} = \frac{1}{2}$$

$$\frac{2x+\frac{1}{x}}{2} = \frac{5}{2}$$

223. If $x = \sqrt{5} + 2$, then $\frac{(2x^2-3x-2)}{3x^2-4x-3} = ?$

अगर $x = \sqrt{5} + 2$ है तो $\frac{(2x^2-3x-2)}{(3x^2-4x-3)} = ?$

a) 0.1785 b) 0.525 c) 0.625 d) 0.785

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

$\frac{1}{x} = \sqrt{5} - 2$

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

$\frac{2x - \frac{2}{x} - 3}{3x - \frac{3}{x} - 4} = \frac{2\left(x - \frac{1}{x}\right) - 3}{3\left(x - \frac{1}{x}\right) - 4} = \frac{5}{8}$

$\frac{5}{8} = 62.5\% = .625$

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224. If $x + \frac{1}{x} = 5$, then $\frac{x^4+3x^3+5x^2+3x+1}{x^4+1} = ?$

अगर $x + \frac{1}{x} = 5$ है तो $\frac{x^4+3x^3+5x^2+3x+1}{x^4+1} = ?$

a) $\frac{43}{23}$ b) $\frac{47}{21}$ c) $\frac{41}{23}$ d) $\frac{45}{21}$ ✓

$\div x^2$ $\div x$

$x^2+\frac{1}{x^2}$ $x^3+\frac{1}{x}$

$$= \frac{x^2+\frac{1}{x^2}+3\left(x+\frac{1}{x}\right)+5}{x^2+\frac{1}{x^2}}$$

$$= \frac{23+15+5}{23}$$

225. If x is real, and $x^4 - 5x^2 - 1 = 0$, then the value of $\left(x^6 - 3x^2 + \frac{3}{x^2} - \frac{1}{x^6} + 1\right)$ is :

यदि x वास्तविक है और $x^4 - 5x^2 - 1 = 0$ है, तो $\left(x^6 - 3x^2 + \frac{3}{x^2} - \frac{1}{x^6} + 1\right)$ का मान है:

a)126 b)110 c)116 d)96

$$\left(x^6 - \frac{1}{x^6}\right) - 3\left(x^2 - \frac{1}{x^2}\right) + 1$$

$$= 140 - 15 + 1 = 126$$

$$x^2 - \frac{1}{x^2} = 5$$

$\times 3$

$$125 + 15 = 140$$