CGL CHSL 2021

MATHS

60 दिन 60 मैराथन

08:30 PM

Algebra 1

4 नंबर पक्का

16/60

Target 50/50

ADITYA RANJAN
CGL TOPPER

अब तो OFFICER बन के रहेंगे

- ✓ CHAPTERWISE
- ✓ MOCK TEST
- ✓ LATEST QUESTIONS ASKED BY TCS IN VARIOUS EXAMS
- ✓ DIVIDED ON DIFFERENT LEVELS.

अपनी मंज़िल को भुला कर जिया तो क्या जिया

है दम तुझमे तो उसे पा के दिखा

लिखे दे खून से अपने कामयाबी की कहानी

और बोल उस किस्मत को है दम तो मिटा के दिखा

ALGEBRA - 01

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

* $x^2 + \frac{1}{x^2} = (n^2 - 2)$

* $x^3 + \frac{1}{x^3} = (n^3 - 3n)$

* $x^4 + \frac{1}{x^4} = (n^2 - 2)^2 - 2$

* $x^5 + \frac{1}{x^5} = (n^2 - 2)(n^3 - 3n) - n$

* $x^6 + \frac{1}{x^6} = (n^3 - 3n)^2 - 2$

x* If $x + \frac{1}{x} = 4$

(a) $x^2 + \frac{1}{x^2} = 4^2 - 2 = 14$

(b) $x^4 + \frac{1}{x^4} = 14^2 - 2 = 194$

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

(a) $x^2 + \frac{1}{x^2} = 3^2 - 2 = 7$

$(47)^2 = 2209$

(b) $x^4 + \frac{1}{x^4} = 7^2 - 2 = 47$

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

* If $x + \frac{1}{x} = 3 \rightarrow n$

(a) $x^3 + \frac{1}{x^3} = n^3 - 3n$

$= 3^3 - 3 \times 3$

$= 27 - 9 = 18$

(b) $x^6 + \frac{1}{x^6} = 18^2 - 2$

$= 324 - 2$

$= 322$

* If $x + \frac{1}{x} = 4$

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

$= 64 - 12$

$= 52$

* $x^6 + \frac{1}{x^6} = 52^2 - 2$

$= 2704 - 2$

$= 2702$

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

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

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

(iii) $x^4 + \frac{1}{x^4}$

(iv) $x^5 + \frac{1}{x^5}$

(v) $x^6 + \frac{1}{x^6}$

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

If $x - \frac{1}{x} = 4$, Find

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

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

(iii) $x^3 - \frac{1}{x^3}$

(iv) $x^4 + \frac{1}{x^4}$

(v) $x^5 - \frac{1}{x^5}$

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

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

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

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

$5\sqrt{5} - 3 \times \sqrt{5}$

$= 2\sqrt{5}$

If $x + \frac{1}{x} = \sqrt{5}$, then $x^3 + \frac{1}{x^3}$ is equal to :

$= n^3 - 3n$ (where $n = \sqrt{5}$)

SSC CGL 10 June 2019 (Evening)

(a) $3\sqrt{5}$

(b) $4\sqrt{5}$

(c) $2\sqrt{5}$

(d) $5\sqrt{5}$

If $x + \frac{1}{x} = 3$, then $x^3 + \frac{1}{x^3}$ is equal to :

n

$= n^3 - 3n = 3^3 - 3 \times 3$

$= 18$

SSC CGL 10 June 2019 (Afternoon)

(a) 27

(b) 36

(c) 24

(d) 18

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

$x + \frac{1}{x} = (\sqrt{6})^2 - 2$

$= 4$

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

$= 14$

If $\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{6}$, then $x^2 + \frac{1}{x^2}$ is equal to :

SSC CGL 11 June 2019 (Morning)

(a) 62 (b) 14

(c) 16 (d) 36

मात्र 1sec

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

$x + \frac{1}{x} = 8 - 2 = 6$

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

$= 34$

If $\sqrt{x} + \frac{1}{\sqrt{x}} = 2\sqrt{2}$, then $x^2 + \frac{1}{x^2}$ is equal to :

SSC CGL 12 June 2019 (Morning)

(a) 34
(b) 64
(c) 36
(d) 32

If $x+\frac{1}{x} = 8$, then find the value of

$$\frac{5x}{x^2+1-6x}$$

$= \frac{5}{x+\frac{1}{x}-6} = \frac{5}{8-6} = \frac{5}{2}$

SSC CHSL 14/10/2020 (Evening)

(a) 2.5 ✓
(b) 6
(c) 5
(d) 6.5

If $x+\frac{1}{x}=5,\ x\neq 0$ then the value of

$$\frac{x^4+\frac{1}{x^2}}{x^2-3x+1}$$ is equal to :

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

$$= \frac{110}{2} = 55$$

SSC CHSL 20/10/2020 (Morning)

(a) 55 ✓

(b) 60

(c) 65

(d) 50

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

$x+\frac{1}{x}-2\times\sqrt{x}\times\frac{1}{\sqrt{x}} = 16$

$\Rightarrow x+\frac{1}{x} = 18$

$x^2+\frac{1}{x^2} = 18^2-2$

$= 324-2$

$= 322$

If $\sqrt{x}-\frac{1}{\sqrt{x}} = 4$, then $x^2+\frac{1}{x^2}$ is equal to :

SSC CGL 10 June 2019 (Morning)

(a) 192 (b) 326 +2

(c) 322 ✓ (d) 256

मात्र 15sec

$\sqrt{x} - 5 - \frac{1}{\sqrt{x}} = 0$

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

$\Rightarrow x + \frac{1}{x} - 2 = 25$

$\Rightarrow x + \frac{1}{x} = 27$

$x^2 + \frac{1}{x^2} = 27^2 - 2 = 729 - 2 = 727$

If $x - 5\sqrt{x} - 1 = 0$, then $x^2 + \frac{1}{x^2}$ is equal to :

SSC CGL 10 June 2019 (Evening)

(a) 625 (b) 731

(c) 729 (d) 727

If $\sqrt{x} - \frac{1}{\sqrt{x}} = \sqrt{6}$, then $x^2 + \frac{1}{x^2}$ is equal to :

SSC CGL 11 June 2019 (Afternoon)

(a) 62 $+2 = 64$

(b) ~~40~~

(c) ~~54~~

(d) ~~66~~

$\left(x-\frac{1}{x}\right)^2=(13)^2$

$x^2+\frac{1}{x^2}-2\times x\times\frac{1}{x}=169$

$x^2+\frac{1}{x^2}=171$

If $x-\frac{1}{x}=13$, then the value of $x^2+\frac{1}{x^2}=?$

SSC CHSL 20/10/2020 (Morning)

(a) 171 (b) 169

(c) 167 (d) 165

-2.5

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

* $x^2 + \frac{1}{x^2} = 3^2 - 2 = 7$

* $x^4 + \frac{1}{x^4} = 7^2 - 2 = 47$

* $x^4 + \frac{1}{x^4} = 47$

$x^2 + \frac{1}{x^2} = \sqrt{47+2}$

$= 7$

$x + \frac{1}{x} = \sqrt{7+2} = 3$

* $x^4 + \frac{1}{x^4} = 194$

$x^2 + \frac{1}{x^2} = \sqrt{194+2} = \underline{\underline{14}}$

$x + \frac{1}{x} = \sqrt{14+2} = 4$

If $x^4 + x^{-4} = 2207$, $(x > 0)$, then the value of $x + x^{-1}$ is :

SSC CHSL 4 July 2019 (Afternoon)

(a) 19 (b) 7

(c) 11 (d) 9

$$x^4 + \frac{1}{x^4} = 2207$$

$$x^2 + \frac{1}{x^2} = \sqrt{2207+2}$$

$$= 47$$

$$x + \frac{1}{x} = \sqrt{47+2}$$

$$= 7$$

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

SSC CGL Tier-II (11 September 2019)

(a) 5 (b) 8

(c) 4 (d) 6

$x^4 + \frac{1}{x^4} = 14159$

$x^2 + \frac{1}{x^2} = \sqrt{14161}$

$= 119$

$x + \frac{1}{x} = \sqrt{121}$

$= 11$

If $x^4 + \frac{1}{x^4} = 14159$, then the value of $x + \frac{1}{x}$ is

SSC CHSL 19 March 2020 (Afternoon)

(a) 9
(b) 12
(c) 10
(d) 11

Trick

$(101)^2$ =

$(104)^2$ =

$(109)^2$ = 11881

$(107)^2$ = 11449

$(119)^2$ = 13836 1

= 14161

$(113)^2$ = 126 169

= 12769

Special case of $x + \frac{1}{x} = 2$

$x = 1$

Q. If $x + \frac{1}{x} = 2$ $\quad x = 1$

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

(b) $x^{2021} + \frac{1}{x^{2021}} = 1 + 1 = 2$

(c) $x^7 + x^9 + \frac{1}{x^2} + \frac{1}{x^3} = 1 + 1 + 1 + 1 = 4$

If $x + x^{-1} = 2$, then the value of $x^3 + x^{-3}$ is :

SSC CPO 16 March 2019 (Evening)

(a) 1

(b) $\frac{1}{2}$

(c) 2

(d) 3

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

then $x = 1$

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

$x = -1$

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

$x = -1$

$(-1)^{odd} = -1$

$(-1)^{even} = 1$

then (a) $x^{100} = (-1)^{even} = 1$

(b) $x^{101} = (-1)^{odd} = -1$

(c) $x^{1012} + \frac{1}{x^{1013}} = 1 - 1 = 0$

If $a + \frac{1}{a} + 2 = 0$, then the value of $a^{15} - \frac{1}{a^{100}}$ is:

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

SSC CHSL 21 October 2020 (Evening)

(a) 0 (b) 2

(c) – 2 (d) 1

If $p + \left(\frac{1}{p}\right) = 2$, then find the value of $p \times p \times p$.

SSC CHSL 18 March 2020 (Afternoon)

(a) 4
(b) 8
(c) 1
(d) 2

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

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

$$= 3\sqrt{3} - 3\sqrt{3} = 0$$

$$\Rightarrow x^3 + \frac{1}{x^3} = 0$$

$$\Rightarrow \frac{x^6 + 1}{x^3} = 0$$

$$\Rightarrow x^6 + 1 = 0$$

$$\Rightarrow x^6 = -1$$

Q. $x + \frac{1}{x} = \sqrt{3}$

find $x^{24} + x^{18} + x^{12} + x^6 = ?$

then $x^6 = -1$

Q. $\boxed{x + \frac{1}{x} = \sqrt{3}}$

find $x^{2024} + x^{2018} + x^{12130} + x^{12124} + x^{6} + x^{12} = ?$

0

If $x + \frac{1}{x} = \sqrt{3}$, then the value of $x^{18} + x^{12} + x^6 + 1$ is :

$-1 + 1 = 0$

$x^{18} + x^{12} + x^6 + 1$

SSC CHSL 21/10/2020 (Evening)

(a) 0
(b) 2
(c) 3
(d) 1

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

SSC CGL Tier II (12 September 2019)

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

If $5x + \frac{1}{3x} = 4$, then the value of $9x^2 + \frac{1}{25x^2}$ is :

SSC CGL 4 March 2020 (Morning)

(a) $\frac{174}{125}$

(b) $\frac{144}{125}$

(c) $\frac{114}{25}$

(d) $\frac{119}{25}$

If $20x^2 - 30x + 1 = 0$, then what is the value of $25x^2 + \frac{1}{16x^2}$ is :

SSC CGL 5 March 2020 (Afternoon)

(a) $53\frac{1}{2}$

(b) $58\frac{1}{2}$

(c) $53\frac{3}{4}$

(d) $58\frac{3}{4}$

$16a^2 + \frac{1}{25a^2} + 2 \times 4a \times \frac{1}{5a} = 16$

$\Rightarrow 16a^2 + \frac{1}{25a^2} = \left(16 - \frac{8}{5}\right) \times \frac{25}{16}$

$= \frac{16 \times 25}{16} - \frac{8 \times 25}{5 \times 16}$

$= 25 - \frac{5}{2}$

$= \frac{45}{2}$

If $4a + \frac{1}{5a} = 4$, then the value of $25a^2 + \frac{1}{16a^2}$ is :

SSC CHSL 21/10/2020 (Evening)

(a) $\frac{45}{2}$

(b) $\frac{55}{2}$

(c) $\frac{43}{2}$

(d) $\frac{45}{4}$

$$2a + \frac{1}{a} = 4$$

$$\Rightarrow 4a^2 + \frac{1}{a^2} + 2 \times 2a \times \frac{1}{a} = 16$$

$$\Rightarrow 4a^2 + \frac{1}{a^2} = 12$$

$$\Rightarrow a^2 + \frac{1}{4a^2} = 3$$

If $2a + \frac{1}{a} = 4$, then the value of $a^2 + \frac{1}{4a^2}$ is :

SSC CHSL 26/10/2020(Morning)

(a) 3
(b) 4
(c) 5
(d) 12

$2x - 7 + \frac{5}{x} = 0$

$\Rightarrow 2x + \frac{5}{x} = 7$

$\Rightarrow 4x^2 + \frac{25}{x^2} + 2 \times 2x \times \frac{5}{x} = 49$

$\Rightarrow 4x^2 + \frac{25}{x^2} = 29$

$\Rightarrow x^2 + \frac{25}{4x^2} = \frac{29}{4}$

If $2x^2 - 7x + 5 = 0$, then what is the value of $\left(x^2 + \frac{25}{4x^2}\right)$ is :

CGL 2019 Tier II (16/11/2020)

(a) $9\frac{1}{2}$

(b) $7\frac{1}{4}$

(c) $9\frac{3}{4}$

(d) $5\frac{1}{2}$

If $x+\frac{16}{x}=8$, then the value of $x^2+\frac{32}{x^2}$ is :

CGL 2019 Tier II (16/11/2020)

(a) 24
(b) 18
(c) 20
(d) 16

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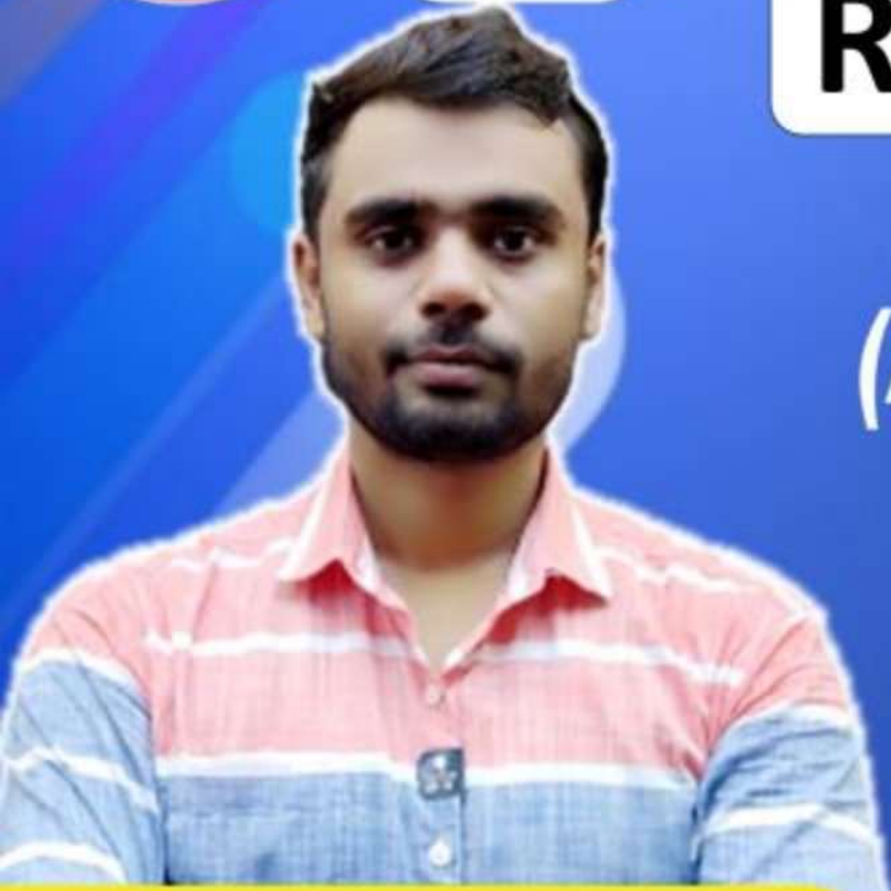

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