CGL CHSL 2021

MATHS

60 दिन 60 मैराथन

08:30 PM

Trigonometry 3

गजब के Tricks

21/60

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

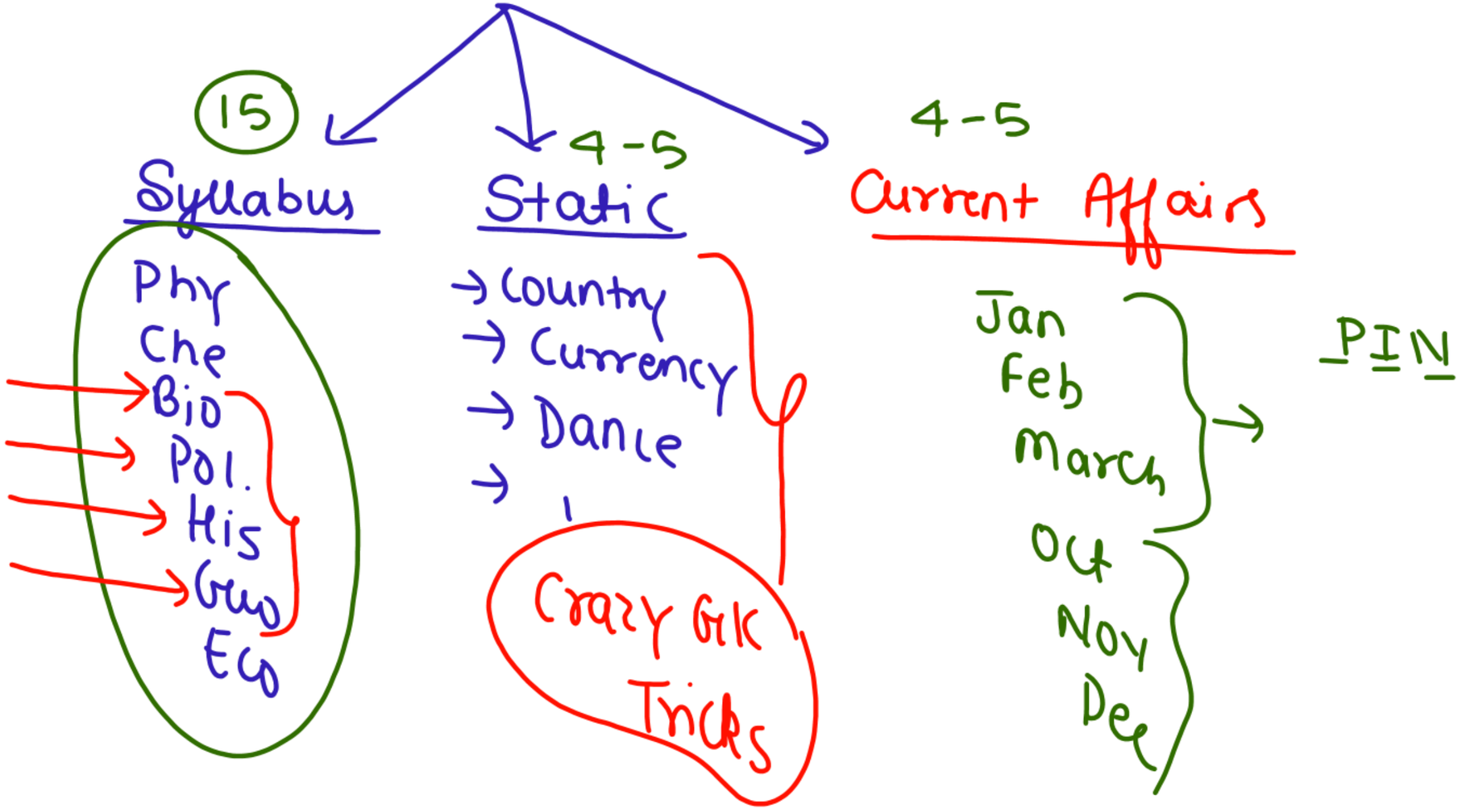
लिखे दे खून से अपने कामयाबी की कहानी

और बोल उस किस्मत को है दम तो मिटा के दिखा

Trigonometry -3

त्रिकोणमिति

G.S की Strategy — CGL/CHSL



$$\frac{\frac{1}{4}}{\frac{1}{3}+\frac{3}{4}-1}$$

$$= \frac{\frac{1}{4}}{\frac{13}{12}-1} = \frac{\frac{1}{4}}{\frac{1}{12}} 3$$

$$= 3$$

If $\dfrac{\cos^2\theta}{\cot^2\theta+\sin^2\theta-1} = 3,\ 0° < \theta < 90°,$ $\theta = 60°$

then the value of $(\tan\theta + \operatorname{cosec}\theta)$ is:

$\sqrt{3} + \frac{2}{\sqrt{3}} = \frac{5}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

यदि $\dfrac{\cos^2\theta}{\cot^2\theta+\sin^2\theta-1} = 3$ है, $0° < \theta < 90°$ है,

तो $(\tan\theta + \operatorname{cosec}\theta)$ का मान ज्ञात करें।

SSC CGL 2020

(a) $2\sqrt{3}$

(b) $\dfrac{5\sqrt{3}}{3}$

(c) $3\sqrt{3}$

(d) $\dfrac{4\sqrt{3}}{3}$

$\theta = 30^\circ$

$\frac{2 \times 3}{2 \times 4}$

$3 \times \frac{1}{2}$

$1 + \cos^2\theta$

$= 1 + \frac{3}{4} = \frac{7}{4}$

If $2\cos^2\theta = 3\sin\theta$, $0° < \theta < 90°$, then the value of $(\sec^2\theta - \tan^2\theta + \cos^2\theta)$ is:

यदि $2\cos^2\theta = 3\sin\theta$ है, $0° < \theta < 90°$ है, तो $(\sec^2\theta - \tan^2\theta + \cos^2\theta)$ का मान ज्ञात करें।

SSC CGL 2020

(a) 7/4

(b) 5/4

(c) 9/4

(d) 3/4

* $1 + \tan^2\theta = \sec^2\theta$

* $1 + \cot^2\theta = \operatorname{cosec}^2\theta$

$$\frac{c^2+\ell+c^2-\ell}{c^2-1} - \tan^2\theta$$

$$= \frac{2\operatorname{cosec}^2\theta}{\cot^2\theta} - \tan^2\theta$$

$$= 2 \times \frac{1}{\frac{\sin^2\theta}{\cos^2\theta}} - \tan^2\theta$$

$$= \sec^2\theta + \sec^2\theta - \tan^2\theta$$

$$= \sec^2\theta + 1$$

$$\frac{\operatorname{cosec}\theta}{(\operatorname{cosec}\theta - 1)} + \frac{\operatorname{cosec}\theta}{(\operatorname{cosec}\theta + 1)} - \tan^2\theta, \quad 0° < \theta <$$

90°, is equal to:

$$\frac{\operatorname{cosec}\theta}{\operatorname{cosec}\theta - 1} + \frac{\operatorname{cosec}\theta}{\operatorname{cosec}\theta + 1} - \tan^2\theta, \quad 0° < \theta <$$

90° का मान ज्ञात करें।

SSC CGL 2020

(a) $2\sec^2\theta$

(b) $\sec^2\theta + 1$

(c) $\sec^2 q$

(d) $1 - \tan^2\theta$

$\sin(3x - 15^\circ) = \frac{1}{2} = \sin 30^\circ$

$3x - 15^\circ = 30^\circ$

$\Rightarrow 3x = 45^\circ \Rightarrow x = 15^\circ$

$\cos^2 45^\circ + \cot^2 30^\circ$

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

$= \frac{7}{2}$

If $2\sin(3x - 15^\circ) = 1$, $0^\circ < (3x - 15) < 90^\circ$, then find the value of $\cos^2 (2x + 15)^\circ + \cot^2 (x + 15)^\circ$.

यदि $2\sin(3x - 15^\circ) = 1$, $0^\circ < (3x - 15) < 90^\circ$ है, तो $\cos^2 (2x + 15)^\circ + \cot^2 (x + 15)^\circ$ का मान ज्ञात करें।

SSC CGL 2020

(a) 1

(b) 5/2

(c) – 7/2

(d) 7/2

$\frac{2A+B+2A-B}{2} = 90^\circ$

$2 \times \frac{4A}{2} = 90 \quad 4S^\circ$

$A = 45^\circ$

$\sin\left(\frac{2A+B}{2}\right) = \sin 60^\circ$

$\Rightarrow \frac{90+B}{2} = 60^\circ \Rightarrow B = 30^\circ$

$\sin[3 \times 15]$

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

If $\sin\left(\frac{2A+B}{2}\right) = \cos\left(\frac{2A-B}{2}\right) = \frac{\sqrt{3}}{2}$, $0^\circ, \frac{2A+B}{2}$ < 90 and $0^\circ < \frac{2A+B}{2} < 90^\circ$ then find the value of $\sin[3(A-B)]$.

SSC CGL 2020

(a) 1

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

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

(d) 2

* $1+\tan^2\theta = \sec^2\theta$
* $1+\cot^2\theta = \operatorname{cosec}^2\theta$
* $\cos^2\theta+\sin^2\theta=1$

The numerical value of

$$\frac{5}{\sec^2\theta}+\frac{2}{1+\cot^2\theta}+3\sin^2\theta \text{ is :}$$

SSC CGL 13 June 2019 (Evening)

$5\cos^2\theta + 2\sin^2\theta + 3\sin^2\theta$

$= 5\cos^2\theta + 5\sin^2\theta$

$= 5(\cos^2\theta+\sin^2\theta)$

$= 5$

(a) 5
(b) 2
(c) 3
(d) 4

The numerical value of

$$\left(\frac{1}{1+\cot^2\theta}+\frac{3}{1+\tan^2\theta}+2\sin^2\theta\right) \text{ is :}$$

$$= \frac{1}{\text{cosec}^2\theta}+\frac{3}{\sec^2\theta}+2\sin^2\theta$$

$$= \sin^2\theta+3\cos^2\theta+2\sin^2\theta$$

$$= 3\sin^2\theta+3\cos^2\theta$$

(a) 2
(b) 5
(c) 6
(d) 3

* $1+\cot^2\theta = \operatorname{cosec}^2\theta$

$\Rightarrow \cot^2\theta - \operatorname{cosec}^2\theta = -1$

The numerical value of

$$1+\frac{1}{\cot^2 63^\circ}-\sec^2 27^\circ+\frac{1}{\sin^2 63^\circ}-\operatorname{cosec}^2 27^\circ$$

is :

$= 1+\frac{1}{\tan^2 27}-\sec^2 27+\frac{1}{\cos^2 27}-\operatorname{cosec}^2 27$

$= 1+\cot^2 27-\sec^2 27+\sec^2 27-\operatorname{cosec}^2 27$

$= 1+\cot^2 27-\operatorname{cosec}^2 27$

$= 1-1=0$

(a) 1
(b) 2
(c) − 1
(d) 0

* $\sin^2\theta + \cos^2\theta = 1$

ومن * $\sin^4\theta + \cos^4\theta = 1 - 2\sin^2\theta\cos^2\theta$

* $\sin^6\theta + \cos^6\theta = 1 - 3\sin^2\theta\cos^2\theta$

$\theta = 90^\circ$ $S=1$ $C=0$

$$\sin^6\theta + \cos^6\theta + 3\sin^2\theta\cos^2\theta = ?$$

$1 + 0 + 0$

(a) 0

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

(c) 1

(d) $\frac{1}{3}$

$$\sin^6\theta + \cos^6\theta + 3\sin^2\theta\cos^2\theta = ?$$

$1 - 3s^2c^2 + 3s^2c^2$

(a) 0

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

(c) 1

(d) $\frac{1}{3}$

Value Putting
$\theta = 45^\circ$

$$\frac{2+\tan^2\theta+\cot^2\theta}{\sec\theta\,\mathrm{cosec}\,\theta}$$ is equal to :

SSC CGL 4 June 2019 (Morning)

$\frac{2+1+1}{\sqrt{2}\times\sqrt{2}} = \frac{4}{2} = 2$

$$\frac{1+\tan^2\theta+1+\cot^2\theta}{\sec\theta\,\mathrm{cosec}\,\theta}$$

$$= \frac{\sec^2\theta+\mathrm{cosec}^2\theta}{\sec\theta\cdot\mathrm{cosec}\,\theta}$$

$$= \frac{\frac{1}{C^2}+\frac{1}{S^2}}{\frac{1}{C}\cdot\frac{1}{S}} = \frac{\frac{S^2+C^2}{C^2S^2}}{\frac{1}{CS}} = \frac{1}{\cos\theta\cdot\sin\theta}$$

(1) (a) $\cot\theta$

$\frac{1}{2}$ (b) $\cos\theta.\sin\theta$

2 (c) $\sec\theta.\mathrm{cosec}\,\theta$

1 (d) $\tan\theta$

$\theta = 30^\circ$

The value of $\frac{1}{\sin\theta} - \frac{\cot^2\theta}{1+\text{cosec}\theta}$ is :

SSC CGL 6 June 2019 (Evening)

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

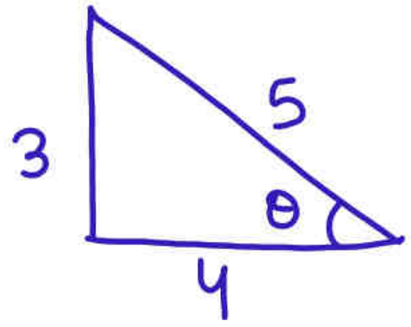
$= 2 - 1 = 1$

(a) 0

(b) 1

(c) 2

(d) -1



The value of $\frac{1}{\sin\theta} - \frac{\cot^2\theta}{1+\text{cosec}\theta}$ is :

SSC CGL 6 June 2019 (Evening)

$$= \frac{1}{\frac{3}{5}} - \frac{\frac{16}{9}}{1+\frac{5}{3}}$$

$$= \frac{5}{3} - \frac{\frac{16}{9}}{\frac{8}{3}}$$

$$= \frac{5}{3} - 2 = \frac{5-6}{3} = -\frac{1}{3}$$

(a) 0

(b) 1

(c) 2

(d) − 1

Imp Result

* $\sec^2\theta - \tan^2\theta = 1$

$\Rightarrow (\sec\theta - \tan\theta)(\sec\theta + \tan\theta) = 1$

$\Rightarrow (\sec\theta - \tan\theta) = \dfrac{1}{(\sec\theta + \tan\theta)}$

If $\frac{1}{\text{cosec}\theta - 1} + \frac{1}{\text{cosec}\theta + 1} = 2\sec\theta,\ 0° < \theta < 90°,$ then the value of $(\cot\theta + \cos\theta)$ is :

SSC CGL 7 June 2019 (Evening)

(a) $\frac{1+\sqrt{2}}{2}$ (b) $\frac{2+\sqrt{2}}{2}$

(c) $\frac{2+\sqrt{3}}{2}$ (d) $1+\sqrt{2}$

$$\frac{c+x+c-x}{c^2-1} = 2\sec\theta$$

$$\Rightarrow \frac{2\text{cosec}\theta}{\cot^2\theta} = 2\sec\theta$$

$$\Rightarrow \frac{2\sin^2\theta}{\sin\theta \times \cos^2\theta} = \frac{2}{\cos\theta}$$

$\tan\theta = 1$ $\quad \theta = 45°$

$$\cot\theta + \cos\theta$$

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

If $3\cos^2 A + 6\sin^2 A = 3$, $0° \le A \le 90°$, then the value of A is :

SSC CHSL 2 July 2019 (Evening)

(a) 30°
(b) 0°
(c) 90°
(d) 45°

$3c^2 + 3s^2 + 3s^2 = 3$

$\Rightarrow 3(c^2+s^2)+3s^2 = 3$

$\Rightarrow 3 + 3s^2 = 3$

$\Rightarrow 3s^2 = 0$

$\Rightarrow \sin^2\theta = 0$

$\theta = 0$

$c^2 + s^2 = 1$

If $\frac{1}{1-\sin\theta}+\frac{1}{1+\sin\theta} = 4\sec\theta$, $0° < \theta < 90°$, then the value of $(3\cot\theta + \operatorname{cosec}\theta)$ is:

SSC CHSL 3 July 2019 (Afternoon)

(a) $\frac{5\sqrt{3}}{3}$

(b) $4\sqrt{3}$

(c) $5\sqrt{3}$

(d) $\frac{2\sqrt{3}}{3}$

$$\frac{1+\sin\theta+1-\sin\theta}{1-\sin^2\theta} = 4\sec\theta$$

$$\Rightarrow \frac{2}{\cos^2\theta} = \frac{4}{\cos\theta}$$

$$\Rightarrow \cos\theta = \frac{1}{2} \qquad \theta = 60°$$

$$3\times\frac{1}{\sqrt{3}} + \frac{2}{\sqrt{3}} = \frac{5\times\sqrt{3}}{\sqrt{3}\times\sqrt{3}}$$

$$= \frac{5\sqrt{3}}{3}$$

$A = 45^\circ$

$(\text{cosec}A - \sin A)^2 + (\sec A - \cos A)^2 - (\cot A - \tan A)^2$ is equal to :

SSC CPO 2018, 16 March 2019 (Evening)

$2 \times \left(\sqrt{2} - \frac{1}{\sqrt{2}}\right)^2$

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

(a) 2
(b) 0
(c) 1
(d) – 1

$\sec\theta + \tan\theta - \sec\theta = \sec\theta \times k$

$\frac{\sin\theta}{\cos\theta} = \frac{1}{\cos\theta} \times k$

$k = \sin\theta$

If $\dfrac{1}{\sec\theta - \tan\theta} - \dfrac{1}{\cos\theta} = \sec\theta \times k$, $0° < \theta < 90°$, then k is equal to :

SSC CHSL 2 July 2019 (Afternoon)

(a) $\text{cosec}\theta$
(b) $\tan\theta$
(c) $\sin\theta$
(d) $\cot\theta$

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SSC Exams

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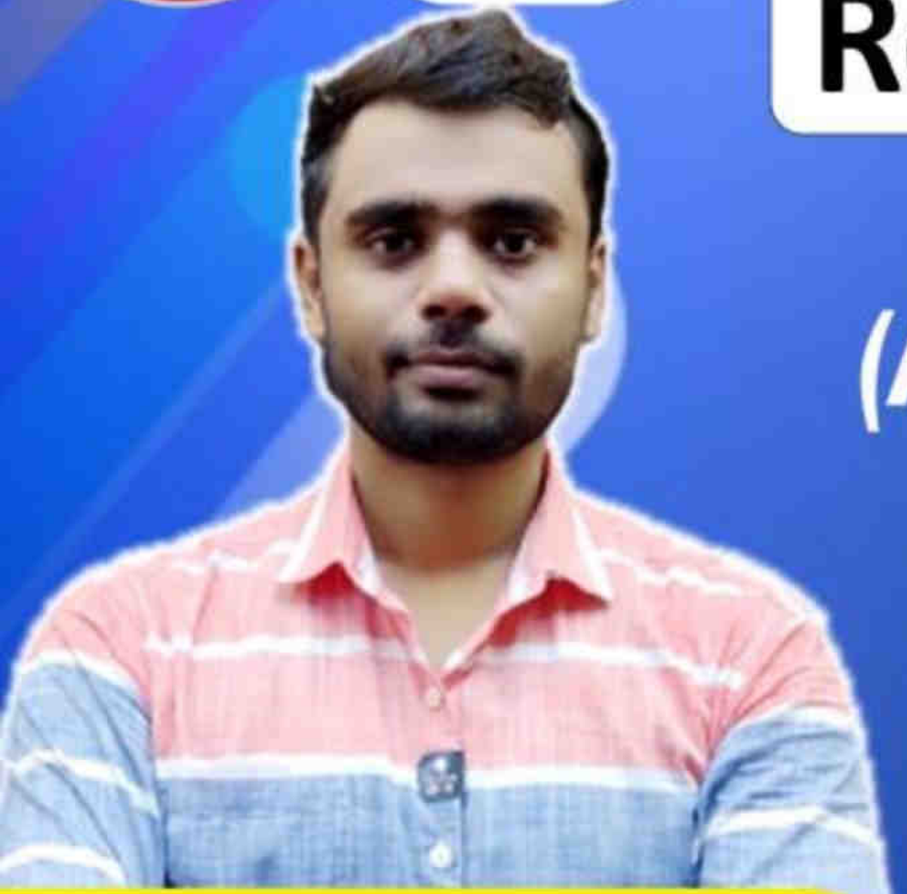

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(MATHS EXPERT)

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