

● TRIGONOMETRY-05

TRIGONOMETRIC IDENTITIES

BY ADITYA RANJAN



Maths By Aditya Ranjan



Rankers Gurukul

PDF की विशेषताएं
INDIA में पहली बार

- **UPDATED CONTENT**
- **TYPE WISE**
- **LEVEL WISE**
- **BILINGUAL**
- **ERROR FREE**

MATHS SPECIAL BATCH
में Enroll करने के लिए

DOWNLOAD

RG VIKRAMJEET APP



GET IT ON
Google Play



Vikramjeet
Install

MATHS EXPERT

TRIGONOMETRY (Practice Sheet – 5)

Questions Based on Basic Trigonometric Identities

- The numerical value of $\frac{5}{\sec^2 \theta} + \frac{2}{1 + \cot^2 \theta} + 3\sin^2 \theta$ is :
SSC CGL 13 June 2019 (Evening)
(a) 5 (b) 2
(c) 3 (d) 4
- The numerical value of $\left(\frac{1}{1 + \cot^2 \theta} + \frac{3}{1 + \tan^2 \theta} + 2\sin^2 \theta\right)$ is :
(a) 2 (b) 5
(c) 6 (d) 3
- The numerical value of $\left(\frac{1}{\cos \theta} + \frac{1}{\cot \theta}\right)\left(\frac{1}{\cos \theta} - \frac{1}{\cot \theta}\right)$ is :
(a) 0 (b) -1
(c) 1 (d) 2
- The value of $\frac{\sin A}{1 + \cos A} + \frac{\sin A}{1 - \cos A}$ is $(0^\circ < A < 90^\circ)$:
(a) 2 cosec A (b) 2 sec A
(c) 2 sin A (d) 2 cos A
- 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 :
(a) 1 (b) 2
(c) -1 (d) 0
- If $\tan 9^\circ = \frac{p}{q}$, then the value of $\frac{\sec^2 81^\circ}{1 + \cot^2 81^\circ}$ is :
(a) $\frac{p}{q}$ (b) 1
(c) $\frac{p^2}{q^2}$ (d) $\frac{q^2}{p^2}$
- $\sin^6 \theta + \cos^6 \theta + 3\sin^2 \theta \cos^2 \theta = ?$
(a) 0 (b) $-\frac{1}{2}$
(c) 1 (d) $\frac{1}{3}$
- What is the value of $\frac{1}{\sin^4(90^\circ - \theta)} + \frac{1}{[\cos^2(90^\circ - \theta) - 1]} = ?$
(a) $\tan^2 \theta \sec^2 \theta$ (b) $\sec^4 \theta$
(c) $\tan^4 \theta$ (d) $\tan^2 \theta \sin^2 \theta$
- What is the value of $\frac{1 + 2\cot^2(90^\circ - x) - 2\operatorname{cosec}(90^\circ - x)\cot(90^\circ - x)}{\operatorname{cosec}(90^\circ - x) - \cot(90^\circ - x)} ?$
(a) $\cos x + \sin x$
(b) $\sin x - \cos x$
(c) $\sec x + \tan x$
(d) $\sec x - \tan x$
- $\frac{2 + \tan^2 \theta + \cot^2 \theta}{\sec \theta \operatorname{cosec} \theta}$ is equal to :
SSC CGL 4 June 2019 (Morning)
(a) $\cot \theta$ (b) $\cos \theta \cdot \sin \theta$
(c) $\sec \theta \cdot \operatorname{cosec} \theta$ (d) $\tan \theta$
- If $(1 + \tan^2 \theta) + [1 + (\tan^2 \theta)^{-1}] = k$, then $\sqrt{k} = ?$
SSC CGL 6 June 2019 (Evening)
(a) $\sec \theta \cdot \operatorname{cosec} \theta$ (b) $\cos \theta \cdot \operatorname{cosec} \theta$
(c) $\sin \theta \cdot \cos \theta$ (d) $\sec \theta \cdot \sin \theta$
- $\frac{(\sec \theta + \tan \theta)(1 - \sin \theta)}{\operatorname{cosec} \theta(1 + \cos \theta)(\operatorname{cosec} \theta - \cot \theta)}$ is equal to :
SSC CHSL 2 July 2019 (Morning)
(a) $\sin \theta$ (b) $\sec \theta$
(c) $\cos \theta$ (d) $\operatorname{cosec} \theta$
- If $\frac{(\sin \theta - \operatorname{cosec} \theta)(\cos \theta - \sec \theta)}{\tan^2 \theta - \sin^2 \theta} = r^3$, then $r = ?$
SSC CHSL 3 July 2019 (Morning)
(a) $\sin \theta \cdot \cos \theta$
(b) $\tan \theta$
(c) $\cot \theta$
(d) $\operatorname{cosec} \theta \cdot \sec \theta$
- If $\left(\frac{\tan \theta - \sec \theta + 1}{\tan \theta + \sec \theta - 1}\right) \sec \theta = \frac{1}{k}$, then $k = ?$
SSC CGL 7 June 2019 (Afternoon)
(a) $1 + \sin \theta$ (b) $1 - \cos \theta$
(c) $1 + \cos \theta$ (d) $1 - \sin \theta$

15. If $\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta} = 1 + k$, then $k = ?$

SSC CGL 7 June 2019 (Evening)

- (a) $\cot\theta + \sec\theta$ (b) $\tan\theta \cdot \csc\theta$
(c) $\tan\theta + \sec\theta$ (d) $\csc\theta \cdot \sec\theta$

16. If $\left(\frac{1}{1+\csc\theta} - \frac{1}{1-\csc\theta}\right) \cos\theta = 2$, $0^\circ < \theta < 90^\circ$, then the value of $\sin^2\theta + \cot^2\theta + \sec^2\theta$ is :

SSC CHSL 3 July 2019 (Evening)

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

17. It is given that $\sqrt{\frac{1-\sin x}{1+\sin x}} = a - \tan x$, then a is equal to :

SSC CHSL 10 July 2019 (Evening)

- (a) $\cos x$ (b) $\sin x$
(c) $\csc x$ (d) $\sec x$

18. $\frac{(1+\cos\theta)^2 + \sin^2\theta}{(\csc^2\theta - 1) + \sin^2\theta} = ?$

SSC CGL Tier-II (11 September 2019)

- (a) $\cos\theta(1+\sin\theta)$
(b) $2\cos\theta(1+\sec\theta)$
(c) $\sec\theta(1+\sin\theta)$
(d) $2\sec\theta(1+\sec\theta)$

19. $\left(\frac{1-\tan\theta}{1-\cot\theta}\right)^2 + 1 = ?$

SSC CGL Tier-II (11 September 2019)

- (a) $\csc^2\theta$
(b) $\sec^2\theta$
(c) $\sin^2\theta$
(d) $\cos^2\theta$

20. $\sqrt{\frac{\cot\theta + \cos\theta}{\cot\theta - \cos\theta}}$ is equal to :

SSC CGL Tier-II (11 September 2019)

- (a) $\sec\theta + \tan\theta$ (b) $1 + \sec\theta \cdot \tan\theta$
(c) $1 - \sec\theta \cdot \tan\theta$ (d) $\sec\theta - \tan\theta$

21. The value of

$$\left(\frac{\sin A}{1-\cos A} + \frac{1-\cos A}{\sin A}\right) \div \left(\frac{\cot^2 A}{1+\csc A} + 1\right) \text{ is :}$$

SSC CGL Tier-II (12 September 2019)

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

22. The value of

$$\frac{\sin\phi(1-\sin\phi)(\sin\phi+\cos\phi)(\sec\phi+\tan\phi)}{\sin\phi(1+\tan\phi)+\cos\phi(1+\cot\phi)} \text{ is :}$$

SSC CGL Tier-II (12 September 2019)

- (a) $2\cos\phi$ (b) $\csc\phi \cdot \sec\phi$
(c) $2\sin\phi$ (d) $\sin^2\phi \cdot \cos^2\phi$

23. $(\sec\phi - \tan\phi)^2(1+\sin\phi)^2 \div \sin^2\phi = ?$

SSC CGL Tier-II (12 September 2019)

- (a) $\cos\phi$ (b) $\cot^2\phi$
(c) $\sec\phi$ (d) $\cos^2\phi$

24. The value of $(1+\cot\theta - \csc\theta)(1+\cos\theta + \sin\theta)\sec\theta = ?$

SSC CGL Tier-II (13 September 2019)

- (a) -2 (b) 2
(c) $\sec\theta \cdot \csc\theta$ (d) $\sin\theta \cdot \cos\theta$

25. The value of $\sqrt{\frac{\csc\phi - \cot\phi}{\csc\phi + \cot\phi}} \div \frac{\sin\phi}{1+\cos\phi}$ is equal to :

SSC CGL Tier-II (12 September 2019)

- (a) $\csc\phi$ (b) $\frac{1}{2}$
(c) $\sec\phi$ (d) 1

26. find the value

$$\frac{(\sin\theta - \cos\theta) - (1 + \tan\theta + \cot\theta)}{1 + \sin\theta \cos\theta} = ?$$

SSC CGL Tier-II (13 September 2019)

- (a) $\sec\theta - \csc\theta$ (b) $\csc\theta - \sec\theta$
(c) $\sin\theta + \cos\theta$ (d) $\tan\theta + \cot\theta$

27. Find the value of

$$\frac{\sin\theta + \cos\theta - 1}{\sin\theta - \cos\theta + 1} \times \frac{\tan^2\theta(\csc^2\theta - 1)}{\sec\theta - \tan\theta}$$

SSC CGL Tier-II (13 September 2019)

- (a) 0 (b) -1
(c) 1 (d) $\frac{1}{2}$

28. The value of $\frac{1 - 2\sin^2\theta \cos^2\theta}{\sin^4\theta + \cos^4\theta} - 1$ is :

SSC CGL 7 March 2020 (Morning)

- (a) $-2\sin^2\theta \cdot \cos^2\theta$ (b) -1
(c) 0 (d) 1

29. The value of $(\csc A + \cot A + 1)(\csc A - \cot A + 1) - 2\csc A$ is

SSC CGL 9 March 2020 (Afternoon)

- (a) $4\csc A$ (b) 2
(c) $2\csc A$ (d) 0

30. If $117\cos^2 A + 129\sin^2 A = 120$ and $170\cos^2 B + 158\sin^2 B = 161$, then the value of $\csc^2 A \cdot \sec^2 B$ is :

SSC CHSL 13/10/2020 (Morning)

- (a) 1 (b) 9
(c) 4 (d) 16

31. If $\tan^4 x - \tan^2 x = 1$, then the value of $\sin^4 x + \sin^2 x = ?$

SSC CHSL 14/10/2020 (Afternoon)

- (a) $\frac{3}{4}$ (b) $\frac{1}{2}$
- (c) 1 (d) $\frac{3}{2}$
32. The value of $\sin^4\theta + \cos^4\theta + 2\sin^2\theta\cos^2\theta$ is
SSC CHSL 19/10/2020 (Evening)
- (a) 1 (b) 2
(c) 4 (d) 0
33. $\cos A(\sec A - \cos A)(\cot A + \tan A) = ?$
SSC CGL 2019, Tier-II (15/10/2020)
- (a) $\sec A$ (b) $\cot A$
(c) $\sin A$ (d) $\tan A$
34. $\left(\frac{1}{\cos\theta} - \frac{1}{\sin\theta}\right) + \frac{1}{\operatorname{cosec}\theta - \cot\theta} - \frac{1}{\sec\theta + \tan\theta} = ?$
SSC CGL 2019, Tier-II (15/10/2020)
- (a) $\sec\theta \cdot \operatorname{cosec}\theta$ (b) $\sin\theta \cdot \tan\theta$
(c) $\operatorname{cosec}\theta \cdot \cot\theta$ (d) $\sin\theta \cdot \cos\theta$
35. The value of $\frac{\sec^2\theta(2 + \tan^2\theta + \cot^2\theta) \div (\sin^2\theta - \tan^2\theta)}{(\operatorname{cosec}^2\theta + \sec^2\theta)(1 + \cot^2\theta)^2}$ is
SSC CGL 2019, Tier-II (15/10/2020)
- (a) -1 (b) 1
(c) -2 (d) 2
36. The value of $\frac{\cos^6\theta + \sin^6\theta + 3\sin^2\theta\cos^2\theta}{\operatorname{cosec}\theta\sec\theta(\sin\theta + \cos\theta - 1)(\sin\theta + \cos\theta + 1)}$ is
SSC CGL 2019, Tier-II (15/10/2020)
- (a) 1 (b) 2
(c) $\frac{1}{2}$ (d) 3
37. The value of $\frac{\sin\theta + \cos\theta - 1}{\sin\theta - \cos\theta + 1} \times \sqrt{\frac{1 + \sin\theta}{1 - \sin\theta}}$
SSC CGL 2019, Tier-II (16/10/2020)
- (a) 1 (b) -1
(c) -2 (d) 2
38. If $0^\circ < \theta < 90^\circ$, $3b \operatorname{cosec}\theta = a \sec\theta$ and $3a \sec\theta - b \operatorname{cosec}\theta = 8$, then the value of $9b^2 + a^2$ is :
SSC CHSL 19/10/2020 (Afternoon)
- (a) 6 (b) 8
(c) 9 (d) 7
39. If $x \sin^3\theta + y \cos^3\theta = \sin\theta \cdot \cos\theta$ and $x \sin\theta = y \cos\theta$ then the value of $x^2 + y^2$ is :
SSC CHSL 20/10/2020 (Morning)
- (a) 0 (b) 4
(c) 1 (d) 2
40. If $4 - 2\sin^2\theta - 5 \cos\theta = 0$, $0^\circ < \theta < 90^\circ$, then the value of $\sin\theta + \tan\theta$ is :
SSC CGL 4 June 2019 (Morning)
- (a) $\frac{3\sqrt{2}}{2}$ (b) $\frac{3\sqrt{3}}{2}$
(c) $3\sqrt{2}$ (d) $2\sqrt{3}$
41. If $\cos^2\theta - 3\cos\theta + 2 = \sin^2\theta$, $0 < \theta < 90^\circ$, then the value of $2\operatorname{cosec}\theta + 4\cot\theta$ is :
SSC CGL 7 June 2019 (Afternoon)
- (a) $\frac{8\sqrt{3}}{3}$ (b) $\frac{4\sqrt{3}}{4}$
(c) $2\sqrt{3}$ (d) $4\sqrt{3}$
42. For θ being an acute angle, $4(2\sin^2\theta + 7\cos^2\theta) = 13$. What is the value of θ ?
SSC CHSL 10 July 2019 (Morning)
- (a) 60° (b) 45°
(c) 30° (d) 0°
43. If $\frac{\sin^2\phi - 3\sin\phi + 2}{\cos^2\phi} = 1$, where $0^\circ < \phi < 90^\circ$, then the value of $(\cos 2\phi + \sin 3\phi + \operatorname{cosec} 2\phi)$ is
SSC CGL Tier-II (12 September, 2019)
- (a) $\frac{2 + \sqrt{3}}{3}$ (b) $\frac{3 + \sqrt{3}}{6}$
(c) $\frac{9 + 4\sqrt{3}}{6}$ (d) $\frac{3 + 2\sqrt{3}}{3}$
44. If $2\cos^2\theta - 3\sin\theta = 3$, $0^\circ < \theta < 90^\circ$, then What is the value of $\sin^2 2\theta + \cos^2\theta + \tan^2 2\theta + \operatorname{cosec}^2 2\theta$ is :
SSC CGL Tier-II (13 September, 2019)
- (a) $\frac{35}{12}$ (b) $\frac{29}{3}$
(c) $\frac{35}{6}$ (d) $\frac{29}{6}$

Answer Key

1.(a)	2.(d)	3.(c)	4.(a)	5.(d)	6.(d)	7.(c)	8.(a)	9.(d)	10.(c)
11.(a)	12.(c)	13.(c)	14.(a)	15.(d)	16.(c)	17.(d)	18.(d)	19.(b)	20.(a)
21.(d)	22.(d)	23.(b)	24.(b)	25.(d)	26.(a)	27.(c)	28.(c)	29.(b)	30.(d)
31.(c)	32.(a)	33.(d)	34.(a)	35.(a)	36.(c)	37.(a)	38.(c)	39.(c)	40.(b)
41.(a)	42.(a)	43.(c)	44.(c)						

Maths by
Aditya Ranjan sir