TRIGONOMETRY-01

TRIGONOMETRIC RATIOS; BASIC CONCEPTS, PYTHAGORAS THEOREM

BY ADITYA RANJAN

Maths By Aditya Ranjan

Rankers Gurukul

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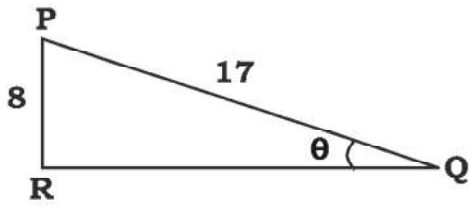
MATHS EXPERT

TRIGONOMETRY (Practice Sheet – 1)

Type-I (Trigonometric Ratios; Basic Concepts, Pythagoras Theorem)

1. In the given figure, what is the value of $\cot\theta$?

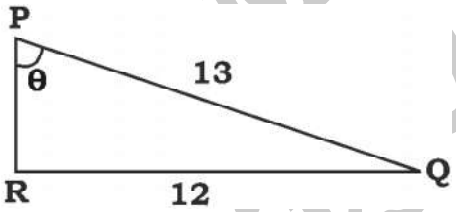


SSC CGL 3 March 2020 (Evening)

(a) $\frac{8}{15}$ (b) $\frac{17}{18}$

(c) $\frac{15}{17}$ (d) $\frac{15}{8}$

2. In the given figure, $\cos\theta$ is equal to :



SSC CGL 7 March 2020 (Afternoon)

(a) $\frac{5}{13}$ (b) $\frac{12}{5}$

(c) $\frac{5}{12}$ (d) $\frac{12}{13}$

3. If sec A = $\frac{5}{3}$, then what is the value of cot A?

CHSL 19/10/2020 (Evening)

(a) $\frac{3}{4}$ (b) $\frac{4}{3}$

(c) $\frac{4}{5}$ (d) $\frac{3}{5}$

4. If cosecA = $\frac{25}{7}$, then what is the value of tanA?

CHSL 17/03/2020 (Afternoon)

(a) $\frac{7}{24}$ (b) $\frac{25}{24}$

(c) $\frac{7}{25}$ (d) $\frac{24}{25}$

5. If $\cot\theta = \frac{80}{39}$, then find the value of $\operatorname{cosec}\theta$.

CHSL 17/03/2020 (Evening)

(a) $\frac{39}{80}$ (b) $\frac{89}{39}$

(c) $\frac{39}{89}$ (d) $\frac{80}{39}$

6. If cos A = 2 sin A, then cosec A is equal to:

CHSL 19/10/2020 (Evening)

(a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{5}}$

(c) 2 (d) $\sqrt{5}$

7. If $\operatorname{cosec}\theta = \frac{x^2+y^2}{x^2-y^2}$, then what will be the value of $\tan\theta$?

CHSL 16/10/2020 (Morning)

(a) $\frac{x^2-y^2}{x^2+y^2}$ (b) $\frac{2xy}{x^2-y^2}$

(c) $\frac{x^2-y^2}{2xy}$ (d) $\frac{x^2+y^2}{2xy}$

8. If cos 27° = x, then the value of tan 63° is :

CHSL 26/10/2020 (Evening)

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

(c) $\frac{\sqrt{1-x^2}}{x}$ (d) $\frac{x}{\sqrt{1-x^2}}$

9. If $\tan x = \frac{m}{n}$ and $0° \le x \le 90°$, then the value of $(\sin x + \cos x)$ is :

CHSL 13/10/2020 (Evening)

(a) $\frac{1}{\sqrt{m^2 - n^2}}$ (b) $\frac{1}{\sqrt{m^2 + n^2}}$

(c) $\frac{m+n}{\sqrt{m^2 + n^2}}$ (d) $\sqrt{m^2 - n^2}$

10. If $\text{cosec}\,\theta = \frac{b}{a}$, then $\frac{\sqrt{3}\cos\theta + 1}{\tan\theta + \sqrt{3}}$ is equal to:

CGL-2019 Tier-II (16/10/2020)

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

(c) $\frac{\sqrt{a^2 + b^2}}{b}$ (d) $\frac{\sqrt{b^2 - a^2}}{b}$

11. If $\sec\theta = \frac{a}{b}$, $b \neq 0$, then $\frac{1 - \tan^2\theta}{2 - \sin^2\theta} = ?$

CGL-2019 Tier-II (15/10/2020)

(a) $\frac{a^2(2b^2 + a^2)}{b^2(a^2 - b^2)}$ (b) $\frac{a^2(2b^2 + a^2)}{b^2(a^2 + b^2)}$

(c) $\frac{a^2(2b^2 - a^2)}{b^2(a^2 + b^2)}$ (d) $\frac{a^2(2b^2 - a^2)}{a^2(a^2 + b^2)}$

12. If $\tan\theta = \frac{p}{q}$, then what is $\frac{p\sec\theta - q\text{cosec}\theta}{p\sec\theta + q\text{cosec}\theta}$ equal to :

(a) $\frac{p - q}{q + p}$ (b) $\frac{q^2 - p^2}{q^2 + p^2}$

(c) $\frac{p^2 - q^2}{q^2 + p^2}$ (d) 1

13. If $\sin 21° = \frac{x}{y}$, then $\sec 21° - \sin 69°$ is equal to :

(a) $\frac{x^2}{y\sqrt{y^2 - x^2}}$ (b) $\frac{y^2}{x\sqrt{y^2 - x^2}}$

(c) $\frac{x^2}{y\sqrt{x^2 - y^2}}$ (d) $\frac{y^2}{x\sqrt{x^2 - y^2}}$

14. If $\frac{\sin A + \cos A}{\cos A} = \frac{17}{12}$, then the value of $\frac{1 - \cos A}{\sin A}$ is :

SSC CGL 7 March 2020 (Afternoon)

(a) -5 (b) 1

(c) $\frac{5}{12}$ (d) $\frac{1}{5}$

15. If $\cos x = \frac{24}{25}$, $0 \le x \le 90°$, then the value of $\cot x + \text{cosec}\, x$ is :

CHSL 14/10/2020 (Morning)

(a) 0 (b) 1

(c) 7 (d) $\frac{7}{2}$

16. If $\cot\theta = \frac{3}{4}$, then $\sin\theta + \cos\theta - \tan\theta$ is equal to :

SSC CGL 11 June 2019 (Morning)

(a) $-\frac{1}{20}$ (b) $\frac{2}{15}$

(c) $\frac{1}{20}$ (d) $\frac{1}{15}$

17. If $\sec\theta = \frac{13}{5}$, then $\tan\theta - \sin\theta + \cos\theta$ is equal to :

SSC CGL 11 June 2019 (Evening)

(a) $\frac{121}{65}$ (b) $\frac{118}{65}$

(c) $\frac{23}{13}$ (d) $\frac{124}{65}$

18. If $3\sin\theta = 4\cos\theta$, then $\tan^2\theta + \sin\theta - \cos\theta$ is equal to :

SSC CGL 12 June 2019 (Afternoon)

(a) $\frac{88}{45}$ (b) 2

(c) $\frac{89}{45}$ (d) $\frac{17}{9}$

19. If $12\sin\theta = 5\cos\theta$, then $\sin\theta + \cos\theta - \cot\theta$ is equal to :

SSC CGL 12 June 2019 (Evening)

(a) $\frac{139}{156}$ (b) $-\frac{71}{65}$

(c) $\frac{116}{156}$ (d) $-\frac{16}{65}$

20. If $\tan\theta = \frac{3}{5}$ $0° < \theta < 90°$, then $\sin\theta\cos\theta$ is equal to :

SSC CHSL 11 July 2019 (Evening)

(a) $\frac{14}{\sqrt{34}}$ (b) $\sqrt{17}$

(c) $\frac{16}{\sqrt{34}}$ (d) $\frac{15}{34}$

21. If $\sin\theta = 4\cos\theta$, then what is the value of $\sin\theta\cos\theta$?

SSC CGL 6 June 2019 (Afternoon)

(a) $\frac{2}{9}$ (b) $\frac{3}{10}$

(c) $\frac{4}{17}$ (d) $\frac{3}{4}$

22. If $\cos\theta = \frac{5}{13}$, then the value of $\tan^2\theta + \sec^2\theta$ is equal to :

CGL 2019 Tier-II (18/10/2020)

(a) $\frac{323}{25}$ (b) $\frac{313}{25}$

(c) $\frac{303}{25}$ (d) $\frac{233}{25}$

23. If $\cos\theta = \frac{3}{5}$, then the value of $\sin\theta . \sec\theta . \tan\theta$ is :

(a) $\frac{9}{16}$ (b) $\frac{16}{9}$

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

24. If $\text{cosec}\,\theta = \frac{13}{12}$, then $\sin\theta + \cos\theta - \tan\theta$ is equal to :

SSC CGL 11 June 2019 (Afternoon)

(a) $\frac{91}{65}$ (b) $\frac{139}{65}$

(c) $\frac{71}{65}$ (d) $-\frac{71}{65}$

25. If $\sin\theta - \cos\theta = \frac{7}{13}$, $0 < \theta < 90°$, then the value of $\sin\theta + \cos\theta$ is :

(a) $\frac{17}{13}$ (b) $\frac{13}{17}$

(c) $\frac{1}{13}$ (d) $\frac{1}{17}$

26. If $\sec\theta + \tan\theta = 2+\sqrt{5}$, then the value of $\sin\theta + \cos\theta$ is :

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

(c) $\frac{7}{\sqrt{5}}$ (d) $\frac{1}{\sqrt{5}}$

27. If $\sin\theta - \cos\theta = \frac{7}{17}$, then find the value of $\sin\theta + \cos\theta$.

SSC CHSL 14/10/2020 (Evening)

(a) $\frac{8}{17}$ (b) $\frac{23}{13}$

(c) $\frac{23}{17}$ (d) $\frac{8}{13}$

28. If $\tan\theta = \frac{20}{21}$, then the value of $\frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta}$ is :

CHSL 12/10/2020 (Evening)

(a) $\frac{-1}{41}$ (b) $\frac{27}{21}$

(c) $\frac{29}{35}$ (d) $\frac{-29}{31}$

29. For θ being an acute angle, if $\text{cosec}\,\theta = 1.25$, then the value of $\frac{4\tan\theta - 5\cos\theta}{\sec\theta + 4\cot\theta}$ is equal to :

SSC CHSL 4 July 2019 (Morning)

(a) $\frac{3}{7}$ (b) $\frac{4}{7}$

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

30. If $5\cos\theta - 12\sin\theta = 0$, then the value of $\frac{2\sin\theta + \cos\theta}{\cos\theta - \sin\theta}$ is :

SSC CPO 2018, 16 March 2019 (Morning)

(a) $1\frac{75}{119}$ (b) $\frac{2}{3}$

(c) $2\frac{34}{35}$ (d) $3\frac{1}{7}$

31. If $\tan\theta = \frac{2}{3}$, then $\frac{3\sin\theta - 4\cos\theta}{3\sin\theta + 4\cos\theta}$ is equal to :

SSC CGL 10 June 2019 (Afternoon)

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

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

32. If $\tan\theta = \frac{3}{4}$, then $\frac{4\sin\theta - \cos\theta}{4\sin\theta + \cos\theta}$ is equal to :

SSC CGL 10 June 2019 (Evening)

(a) $\frac{1}{4}$ (b) $\frac{3}{5}$

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

33. If A lies in the first quadrant and $6\tan A = 5$, then the value of $\frac{8\sin A - 4\cos A}{\cos A + 2\sin A}$ is :

SSC CGL 3 March 2019 (Morning)

(a) -2 (b) 1

(c) 16 (d) 4

34. If $5\cot\theta = 3$, then find the value of $\frac{6\sin\theta - 3\cos\theta}{7\sin\theta + 3\cos\theta}$ is :

SSC CGL 9 March 2020 (Afternoon)

(a) $\frac{21}{44}$ (b) $\frac{44}{21}$

(c) $\frac{11}{40}$ (d) $\frac{20}{41}$

35. If $\tan x = \frac{3}{2}$, then the value of $\frac{3\sin x + 2\cos x}{3\sin x - 2\cos x}$ is :

CHSL 14/10/2020 (Morning)

(a) $\frac{1}{5}$ (b) $\frac{5}{13}$

(c) $\frac{13}{5}$ (d) 5

36. If $5\cos\theta - 12\sin\theta = 0$, then the value of $\frac{1+\sin\theta+\cos\theta}{1-\sin\theta+\cos\theta}$ is :

SSC CGL 5 March 2019 (Afternoon)

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

(c) $\frac{5}{4}$ (d) $\frac{5}{2}$

37. If $\operatorname{cosec}\theta = \frac{12}{13}$, then the value of $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}$ is :

CHSL 26/10/2020 (Morning)

(a) 2 (b) 4

(c) 1 (d) 3

38. If $\cot\theta = \sqrt{6}$, then the value of $\frac{\operatorname{cosec}^2\theta + \sec^2\theta}{\operatorname{cosec}^2\theta - \sec^2\theta}$ is :

SSC CHSL 3 July 2019 (Morning)

(a) $\frac{49}{36}$ (b) $\frac{43}{36}$

(c) $\frac{7}{5}$ (d) $\frac{48}{35}$

39. If $\tan\theta = \frac{2}{\sqrt{11}}$, $0 < \theta < 90°$, then the value of $\frac{2\operatorname{cosec}^2\theta - 3\sec^2\theta}{3\operatorname{cosec}^2\theta + 4\sec^2\theta}$ is equal to :

CHSL 26/10/2020 (Evening)

(a) $\frac{11}{45}$ (b) $\frac{11}{49}$

(c) $\frac{13}{49}$ (d) $\frac{10}{49}$

40. If $\tan\alpha = \frac{2}{\sqrt{13}}$, then the value of $\frac{\operatorname{cosec}^2\alpha + 2\sec^2\alpha}{\operatorname{cosec}^2\alpha - 3\sec^2\alpha}$ is :

CHSL 18/03/2020 (Evening)

(a) 21 (b) 14

(c) 32 (d) 16

41. In ΔABC, $\angle B = 90°$ and AB : BC = 2 : 1. the value of sinA + cot C is :

(a) $3+\sqrt{5}$ (b) $\frac{2+\sqrt{5}}{2\sqrt{5}}$

(c) $2+\sqrt{5}$ (d) $3-\sqrt{5}$

42. In ΔABC, $\angle C = 90°$ and AB = *c*, BC = *a*, CA = *b*, then the value of (cosecB – cosA) is :

(a) $\frac{c^2}{ab}$ (b) $\frac{b^2}{ac}$

(c) $\frac{a^2}{bc}$ (d) $\frac{bc}{a^2}$

43. In ΔABC, right angled at B, if $\tan A = \frac{1}{2}$, then the value of $\frac{\sin A(\cos C + \cos A)}{\cos C(\sin C - \sin A)}$ is :

SSC CGL 2019, Tier-II (16/10/2020)

(a) $2\sqrt{5}$ (b) 3

(c) 2 (d) 1

44. In ΔPQR, $\angle Q = 90°$. If $\cot R = \frac{1}{3}$, then what is the value of $\frac{\sec P(\cos R + \sin P)}{\operatorname{cosec} R(\sin R - \operatorname{cosec} P)}$ is

SSC CGL 2019, Tier-II (15/10/2020)

(a) $\frac{2}{7}$ (b) $-\frac{2}{7}$

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

45. If $0° < A, B < 45°$, $\cos(A+B) = \frac{24}{25}$ and $\sin(A-B) = \frac{15}{17}$, then tan2A = ?

SSC CGL 6 March 2020 (Afternoon)

(a) 0 (b) 1

(c) $\frac{416}{87}$ (d) $\frac{213}{4}$

46. If $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{5}{4}$, the value of $\frac{\tan^2\theta + 1}{\tan^2\theta - 1}$ is :

(a) $\frac{25}{16}$ (b) $\frac{41}{9}$

(c) $\frac{41}{40}$ (d) $\frac{40}{41}$

Type-II (Componendo and Dividendo Rule)

47. If $\frac{2\sin\theta - \cos\theta}{\cos\theta + \sin\theta} = 1$, then the value of $\cot\theta$ is :

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

(c) 3 (d) 2

48. If $\frac{\cos\theta + \sin\theta}{\cos\theta - \sin\theta} = 8$, then the valur of $\cot\theta$ is equal to :

SSC CHSL 12/10/2020 (Morning)

(a) $\frac{6}{5}$ (b) $\frac{9}{7}$

(c) $\frac{7}{6}$ (d) $\frac{8}{7}$

49. If $\frac{\tan\theta + \cot\theta}{\tan\theta - \cot\theta} = 2$, $0° \le \theta \le 90°$, then find the value of $\sin\theta$.

(a) $\frac{2}{\sqrt{3}}$ (b) $\frac{\sqrt{3}}{2}$

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

50. If $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = \frac{5}{3}$ then $\sin\theta$ is equal to :

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

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

51. If $\frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = 3$ and θ is an acute angle, then the value of $\frac{3\sin\theta + 4\cos\theta}{8\cos\theta - 3\sin\theta}$ is .

CHSL 21/10/2020 (Morning)

(a) 10 (b) $\frac{1}{2}$

(c) 5 (d) 2

52. If $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = 5$ and θ is an acute angle, then the value of $\frac{3\cos^2\theta + 1}{3\cos^2\theta - 1}$ is :

CHSL 26/10/2020 (Afternoon)

(a) 3 (b) 2

(c) 1 (d) 4

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

SSC CGL 10 June 2019 (Morning)

(a) $\operatorname{cosec}\theta$ (b) $\sec\theta$

(c) $\cos\theta$ (d) $\sin\theta$

54. If $\frac{\sec\theta + \tan\theta}{\sec\theta - \tan\theta} = 2\frac{51}{79}$, then the value of $\sin\theta$ is equal to :

CGL 2019, Tier-II (18/10/2020)

(a) $\frac{65}{144}$ (b) $\frac{35}{72}$

(c) $\frac{91}{144}$ (d) $\frac{39}{72}$

Answer Key

1. (d)	**2.**(a)	**3.** (a)	**4.** (a)	**5.** (b)	**6.** (d)	**7.** (c)	**8.** (d)	**9.** (c)	**10.** (a)
11.(c)	**12.**(c)	**13.**(a)	**14.**(d)	**15.**(c)	**16.**(d)	**17.**(a)	**18.**(c)	**19.**(b)	**20.**(d)
21.(c)	**22.**(b)	**23.**(b)	**24.**(d)	**25.**(a)	**26.**(a)	**27.**(c)	**28.**(a)	**29.**(d)	**30.**(d)
31.(a)	**32.**(d)	**33.**(b)	**34.**(a)	**35.**(a)	**36.**(a)	**37.**(d)	**38.**(c)	**39.**(d)	**40.**(a)
41.(b)	**42.**(c)	**43.** (b)	**44.** (b)	**45.** (c)	**46.** (c)	**47.** (a)	**48.** (b)	**49.** (b)	**50.** (c)
51.(c)	**52.**(d)	**53.**(b)	**54.**(a)						

All The Best