



**IMPORTANT (SHORT QUESTIONS) FROM Chap #09 – 14 (Sec C)**

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1. Verify  $\sin^2 30^\circ : \sin^2 45^\circ : \sin^2 60^\circ : \sin^2 90^\circ = 1 : 2 : 3 : 4$
2. Prove that  $\sin 2\alpha = 2 \sin \alpha \cos \alpha$
3. Prove that  $\cos 20^\circ + \cos 100^\circ + \cos 140^\circ = 0$
4. Solve the triangle ABC if  $a = 32$ ,  $b = 40$  &  $c = 66$
5. Prove that: 
$$\frac{\cos \theta - \sin \theta}{\cos \theta + \sin \theta} = \frac{\cot \theta - 1}{\cot \theta + 1}$$
6. Convert  $16^\circ 30'$  to circular measure
7. Solve equation  $\sin 2x = \cos x$
8. Show that  $r_1 = s \tan \alpha$
9. Prove that  $r = (s - b) \tan \frac{\beta}{2}$
10. Prove that  $\frac{\sin 2\alpha}{1 + \cos \alpha} = \tan \alpha$
11. Convert  $21.256^\circ$  to D<sup>o</sup> M' S"
12. What is the Circular Measure of the angle between hands of a watch at 5 O' clock?
13. Express  $\sin (x + 45^\circ) \sin (x - 45^\circ)$  as sum or difference
14. Prove that:  $\tan (\alpha + \beta) + \tan \gamma = 0$
15. If  $\alpha, \beta, \gamma$  are the angles of  $\triangle ABC$ , prove that  $\tan \alpha + \tan \beta + \tan \gamma = \tan \alpha \tan \beta \tan \gamma$
16. Express  $2 \sin 7\theta \cos 3\theta$  as sum & difference.
17. Show that 
$$\frac{\sin (360^\circ - \theta) \cos (180^\circ - \theta) \tan (180^\circ + \theta)}{\sin (90^\circ - \theta) \cos (90^\circ - \theta) \tan (360^\circ + \theta)} = 1$$
18. Express  $120^\circ 40''$  in radians
19. Define Radian.
20. Find  $\theta$ , when  $\ell = 10\text{cm}$  and  $r = 2\text{cm}$
21. State Fundamental Law of Trigonometry
22. What is the period of  $3 \cos \frac{x}{5}$  ?
23. Give the Cosine of Half the Angle in terms of the sides.
24. At the top of the cliff 80 m high, the angle of depression of a boat is  $12^\circ$ . How far is the boat from the cliff?
25. Find the area of the triangle ABC, given the sides  $a = 18$ ,  $b = 24$ ,  $c = 30$
26. Define Circum-Radius.
27. Show that  $\cos^{-1} \frac{12}{13} = \sin^{-1} \frac{5}{13}$
28. Show that  $\cos^{-1}(-x) = \pi - \cos^{-1} x$
29. Give or state hero's formula.
30. Prove that  $\sec \theta \csc \theta \sin \theta \cos \theta = 1$
31. If  $\alpha, \beta, \gamma$  are the angles of a triangle ABC then prove that  $\sin(\alpha + \beta) = \sin \gamma$
32. Find the value of  $\cos 15^\circ$
33. State Fundamental Law of Trigonometry.
34. Prove that  $R = \frac{abc}{4\Delta}$

35. Convert  $\frac{25\pi}{36}$  into the measure of sexagesimal system.
36. Solve  $\sin x \cos x = \frac{\sqrt{3}}{4}$
37. Express  $\sin 5x + \sin x$  as a product .
38. Convert  $75^{\circ} 6' 30''$  to radians
39. Write domain & range of  $\cos x$
40. Write domain & range of  $\tan x$
41. Solve the equation  $\cot^2 \theta = \frac{1}{3}$
42. Prove that  $\tan(45^{\circ} + A) \tan(45^{\circ} - A) = 1$
43. Show that  $(\tan \theta + \cot \theta)^2 = \sec^2 \theta \operatorname{cosec}^2 \theta$
44. Define In-circle
45. Find the Period of  $\sin \frac{x}{5}$
46. Solve  $\sin x + \cos x = 0$
47. Prove the identity  $1 + \tan \alpha \tan 2\alpha = \sec 2\alpha$
48. Express  $\cos 7\theta - \cos \theta$  as a product
49. Define Circum-circle
50. The area of a triangle is 2437. If  $a = 79$ ,  $c = 97$  then find the angle  $\beta$
51. Prove that  $\sin(\theta + \frac{\pi}{6}) + \cos(\theta + \frac{\pi}{3}) = \cos \theta$
52. Show that  $\cos(2\sin^{-1} x) = 1 - 2x^2$
53. If  $\cot \theta = \frac{15}{8}$  & the terminal arm of the angle is not in I quad, find the values of  $\cos \theta$  &  $\operatorname{cosec} \theta$
54. Convert  $54^{\circ} 45'$  into radians
55. Prove that  $rr_1 r_2 r_3 = \Delta^2$
56. Express  $2 \sin 7\theta \sin 2\theta$  as a sum or difference
57. Define the Angle of Elevation
58. Convert  $\frac{2\pi}{3}$  into radians
59. Find the solution of the equation  $\tan^2 \theta - \sec \theta - 1 = 0$  which lie in  $[0, 2\pi]$
60. Show that  $\frac{1 - \sin \theta}{\cos \theta} = \frac{\cos \theta}{1 + \sin \theta}$
61. A ladder leaning against a vertical wall makes an angle of  $24^{\circ}$  with the wall. If its foot is 5m from the wall, find its length.
62. Express  $\cos 12^{\circ} + \cos 48^{\circ}$  as a product
63. Find the period of  $3 \tan \frac{x}{7}$
64. Prove that  $\frac{\cos 11^{\circ} + \sin 11^{\circ}}{\cos 11^{\circ} - \sin 11^{\circ}} = \tan 56^{\circ}$
65. Prove that  $\frac{\cos 8^{\circ} - \sin 8^{\circ}}{\cos 8^{\circ} + \sin 8^{\circ}} = \tan 37^{\circ}$
66. Prove that  $\cos 2\theta = \frac{1 - \tan^2 \theta}{1 + \tan^2 \theta}$
67. Show that  $\frac{\sin \alpha - \sin \beta}{\sin \alpha + \sin \beta} = \tan \left( \frac{\alpha - \beta}{2} \right) \cot \left( \frac{\alpha + \beta}{2} \right)$
68. Show that  $\frac{\cos(90^{\circ} + \theta) \operatorname{Sec}(-\theta) \tan(180^{\circ} - \theta)}{\operatorname{Sec}(360^{\circ} - \theta) \sin(180^{\circ} + \theta) \cot(90^{\circ} - \theta)} = -1$
69. Find the measure of the greatest angle, if sides of triangle are 16, 20, 33
70. The measures of side of a triangular plot are 413, 214 & 375 meters. Find the measure of the corner angles of the plot.
71. Prove that  $(r_1 + r_2) \tan \frac{\gamma}{2} = a$
72. Prove that  $(r_3 + r) \cot \frac{\gamma}{2} = c$

73. Prove that  $abc (\sin \alpha + \sin \beta + \sin \gamma) = 4\Delta s$
74. Solve  $4\cos^2 x - 3 = 0$
75. Solve the trigonometric equation  $\sec^2 \theta = \frac{4}{3}$
76. Verify  $\sin^2 \frac{\pi}{6} : \sin^2 \frac{\pi}{4} : \sin^2 \frac{\pi}{3} : \sin^2 \frac{\pi}{2} = 1 : 2 : 3 : 4$
77. Find x, if  $\tan^2 45^\circ - \cos^2 60^\circ = x \sin 45^\circ \cos 45^\circ \tan 60^\circ$
78. Verify  $\sin^2 \frac{\pi}{6} + \sin^2 \frac{\pi}{4} + \tan^2 \frac{\pi}{4} = 2$
79. Prove that  $\sec^2 A + \operatorname{cosec}^2 A = \sec^2 A \operatorname{cosec}^2 A$
80. Show that  $\tan^{-1} A + \cot^{-1} A = \frac{\pi}{2}$
81. Prove that  $\frac{\tan \frac{\theta}{2} + \cot \frac{\theta}{2}}{\cot \frac{\theta}{2} - \tan \frac{\theta}{2}} = \sec \theta$
82. Prove that  $\frac{\operatorname{cosec} \theta + 2 \operatorname{cosec} 2\theta}{\sec \theta} = \cot \frac{\theta}{2}$
83. Prove that  $\frac{2 \tan \theta}{1 - \tan^2 \theta} = 2 \sin \theta \cos \theta$
84. Prove that  $2 \tan^{-1} A = \tan^{-1} \frac{2A}{1 - A^2}$
85. Prove that  $\cos^2 \theta - \sin^2 \theta = \frac{1 - \tan^2 \theta}{1 + \tan^2 \theta}$
86. Prove that  $\tan^{-1} A - \tan^{-1} B = \tan^{-1} \frac{A - B}{1 - AB}$
87. Give the range and domain of  $\cos^{-1} x$
88. Prove that  $\tan^{-1} \frac{120}{119} = 2 \cos^{-1} \frac{12}{13}$
89. Show that  $\sin (2 \cos^{-1} x) = 2x\sqrt{1 - x^2}$
90. Prove that  $\cos 2\alpha = 2 \cos^2 \alpha - 1$
91. Write the Triple Angle Identity of  $\tan 3\alpha$
92. Prove that  $\sec \theta \operatorname{cosec} \theta \sin \theta \cos \theta = 1$
93. What is the relation between a radian and a degree?
94. Is the relation  $l = r\theta^\circ$  valid?
95. Convert  $\frac{19\pi}{32}$  into sexagesimal system.
96. What is the Circular Measure of the angle between hands of a watch at 8 O' clock?
97. A horse is tethered to a peg by a rope of 9 meters length & it can move in a circle with the peg as center. If the horse moves along the circumference of the circle, keeping the rope tight, how far will it have gone when the rope has turned an angle of  $55^\circ$ ?
98. Define Co-terminal Angles
99. Define Allied Angles
100.  $\frac{1 + \cos \theta}{1 - \cos \theta} = (\operatorname{cosec} \theta + \cot \theta)^2$