Class-X Maths Introduction to Trigonometry CBSE Test Paper - 01 [session: 2015]

1. (i) Prove that: $\sin^6\theta + \cos^6\theta = 1 - 3\sin^2\theta\cos^2\theta$ (ii) Prove (1+cotA-cosecA)(1+tanA+secA) = 2

2. If sin A+ cos A = x , prove that $\sin^6 A + \cos^6 A = [4 - 3(x^2 - 1)]/4$

3. if cosec A - sin A=a^3 , sec A - cos A=b^3 ,prove that $a^2b^2(a^2+b^2) = 1$

4. If sec A+ tan A = p, then find the value of sec A – tan A

5. Prove that : $(\tan\theta + \sec\theta - 1).(\tan\theta + 1 + \sec\theta) = \frac{2\sin\theta}{1-\sin\theta}$

6. if $\sin\theta = \frac{c}{\sqrt{c^2+d^2}}$ and d >0 find the value of cos θ and tan θ

7. If $\sin A + \sin^2 A + \sin^3 A = 1$, prove that $\cos^6 A - 4\cos^4 A + 8\cos^2 A = 4$.

8. if m = cos A - sin A and n = cos A + sin A, show that $\frac{m^2+n^2}{m^2-n^2} = \frac{-1}{2}\, SecA.Cosec\, A = \frac{\cot A + \tan A}{2}$

9. Prove that (sinθ - cosθ + 1)/ (sinθ + cosθ – 1) = 1/ (secθ – tanθ), using the identity $\sec^2\theta = 1 + \tan^2\theta$

10. Write all other trignometrical identities in form of cot A?

11. If ∠A and ∠B are acute angles such that cos A = cos B, then show that ∠A = ∠B.

12. Express sin 67° + cos 75° in terms of trigonometric ratios of angles between 0° and 45°.

13. Prove that cos θ - sin θ =√ 2 sin θ, if sin θ + cos θ = √2 cos θ

14. Prove that (tan A+ sec A- 1) / (tan A - sec A + 1) = sec A + tan A

15. A, B, and C are the interior angles of Δ ABC show that sin(B + C)/2 = cos A/2

16. In ΔABC, if sin (A + B – C) = √3/2 and cos(B + C – A) =1/√2, find A, B and C.

16. In Δ OPQ, right-angled at P,OP = 7cm and OQ – PQ = 1cm. Determine the values of sin Q and cosQ.

18. If tan A + sin A = m and tan A – sin A= n show that $m^2 - n^2 = 4$

19. If x= p sec A + q tan A and y = p tan A +q sec A prove that $x^2 - y^2 = p^2 - q^2$

20. Prove that : (i) $\sec^4\theta - \sec^2\theta = \tan^4\theta + \tan^2\theta$ (ii) Show that $(1-\sin A+\cos A)^2 = 2(1+\cos A)(1-\sin A)$

21. Given 2cos3θ = √3 , find the value of θ.

22. When is an equation called ‘an identity’. Prove the trigonometric identity $1 + \tan^2 A = \sec^2 A$

23. If secθ + tan θ = p, show that $\frac{p^2-1}{p^2+1}\, cosec\theta = 1$

24. If *x* = tan A + sin A and *y* = tan A - sin A, prove that: $\left(\frac{x+y}{x-y}\right)^2 - \left(\frac{x+y}{2}\right)^2 = 1$

25. If cosec (A+B) = 1 and sec(A - B) = 2, evaluate : (i) sin A cos B +cos A sin B. (ii) $\frac{\tan A + \tan B}{1 - \tan A . \tan B}$

26. (i) In a Δ ABC, write tan $\frac{(A+B)}{2}$ in terms of angle C. (ii) If sinθ - cos θ = 0,$0^0 \le \theta \le 90^0$, find the value of θ.

27. If cot θ = 3x - $\frac{1}{12x}$, then show that cotθ + cosecθ = 6x or - $\frac{1}{6x}$

28. Prove that : $\left(\frac{\sin A}{1+\cos A} + \frac{1+\cos A}{\sin A}\right)\left(\frac{\sin A}{1-\cos A} + \frac{1-\cos A}{\sin A}\right) = 4\, cosec\, A. \cot A$

29. Given that cos (A - B) = cos A. cos B + sin A. sin B, find the value of $\cos 15^0$ in two ways.
(i) Taking A = 60^0, B = 45^0 and (ii) Taking A = 45^0 and B = 30^0

30.(i) If sec θ - tan θ = x show that secθ = $\frac{1}{2}\left(\frac{1}{x} + x\right)$ and tanθ $\frac{1}{2}\left(\frac{1}{x} - x\right)$

(ii) If sec θ + tan θ = x show that secθ = $\frac{1}{2}\left(\frac{1}{x} + x\right)$ and tanθ $\frac{1}{2}\left(\frac{1}{x} - x\right)$

31. Simplify: $\frac{\sin^3\theta - \cos^3\theta}{\sin\theta - \cos\theta}$ 32. Show that $(\sin A + cosec A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$