sns academy
a fingerprint school
Sincerity, Nobility and Service

Grade: X **MATHEMATICS-TRIGONOMETRY**

1. Find the value of $\sec^2 42^0 - \cos ec^2 48^0$.
2. If $(1+\cos A)(1-\cos A) = \frac{3}{4}$, find the value of secA.
3. If $\cos ecA + \cot A = x$, find the value of cosecA – cot A.
4. Write the values of $\sec 0^0, \sec 30^0, \sec 45^0, \sec 60^0 \; and \; \sec 90^0$. What happens to see x when x increase from $0^0 \; to \; 90^0$?.
5. Given that $\tan A = \frac{5}{12}$, find the other trigonometric ratios of the angle A.
6. Prove that $\frac{1}{\sec A - \tan A} - \frac{1}{\cos A} - \frac{1}{\sec A + \tan A}$.
7. If $\sin\theta = \frac{12}{13}, 0^0 < \theta < 90^0$, find the value of $\frac{\sin^2\theta - \cos^2\theta}{2\sin\theta.\cos\theta} \times \frac{1}{\tan^2\theta}$.
8. If $\sin(A+B) = 1 \; and \; \tan(A-B) = \frac{1}{\sqrt{3}}$, find the value of (i) tan A + cot B

   (ii) sec A – cosec B .
9. If $\sec A = x + \frac{1}{4x}$, prove that $\sec A + \tan A = 2x \; or \; \frac{1}{2x}$.
10. If $\frac{\tan^3\theta}{1+\tan^2\theta} + \frac{\cot^3\theta}{1+\cot^2\theta} = \sec\theta\cos ec\theta - 2\sin\theta\cos\theta$
11. If $A + B = 90^0$, prove that $\sqrt{\frac{\tan A\tan B + \tan A\cot B}{\sin A\sec B} - \frac{\sin^2 B}{\cos^2 A}} = \tan A$.
12. If $\sec\theta - \tan\theta = x$, show that $\sec\theta = \frac{1}{2}\left(x + \frac{1}{x}\right) and \; \tan\theta = \frac{1}{2}\left(\frac{1}{2} - x\right)$.
13. Evaluate: $\sin\theta.\sec(90-\theta)$.
14. Find the value of $(\cos ec^2\theta - 1).\tan^2\theta$.
15. Prove that $\frac{\sin^3\theta + \cos^3\theta}{\sin\theta + \cos\theta} = 1 - \sin\theta\cos\theta$.
16. If $7\sin^2 A + 3\cos^2 A = 4$, show that $\tan A = \frac{1}{\sqrt{3}}$
17. For any acute angle θ, prove that (i) $\sin^2\theta + \cos^2\theta = 1$ (ii) $1 + \cot^2\theta = \cos ec^2\theta$

18. Prove that $\sqrt{\sec^2\theta + \operatorname{cosec}^2\theta} = \tan\theta + \cot\theta$

19. Prove that $\dfrac{\sin A + \cos A}{\sin A - \cos A} + \dfrac{\sin A - \cos A}{\sin A + \cos A} = \dfrac{2}{1 - 2\cos^2 A}$.

20. If sin A = x and sec A = y then find the value of cotA.

21. If cosec A = 5/3 , then find the value of cos A + tan A.

22. Find the value of $\tan(65^0 - \theta) - \cot(25^0 + \theta)$.

23. Find the value of $\sin 38 - \cos 52^0$.

24. If cosA = 1/2 , find the value of cos A + sec A.

25. Evaluate: $3\cot^2 60 + \sec^2 45^0$.

26. Solve for θ: $\dfrac{\cos^2\theta}{\cot^2\theta - \cos^2\theta} = 3$.

27. If A, B and C are the interior angles of a ΔABC, show that

$\tan\left(\dfrac{A+B}{2}\right) = \cot\dfrac{C}{2}$.

28. If $\sin\theta = \cos\theta$, then find the value of $2\tan^2\theta + \sin^2\theta + 1$

29. If $\tan\theta + \cot\theta = 2$, find the value of $\sqrt{\tan^2\theta + \cot^2\theta}$

30. If $\tan(A - B) = \dfrac{1}{\sqrt{3}}$ and $\tan(A + B) = \sqrt{3}$, find A and B.

31. If $x = r\cos\theta.\sin\phi;\ y = r\sin\theta.\sin\phi;\ z = r\cos\phi$. Prove that $x^2 + y^2 + z^2 = r^2$.

32. Evaluate: $\dfrac{3\tan 25^0 \tan 40^0 \tan 50^0 \tan 65 - \dfrac{1}{2}\tan^2 60^0}{4\left(\cos^2 29 + \cos^2 61^0\right)}$.

33. Prove that $\dfrac{\cot A - \cos A}{\cot A + \cos A} = \dfrac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}$.

34. Given that cos (A-B) = cosA. cosB + sinA. sinB, find the value of $\cos 15^0$ in two ways. (i) $A = 60^0, B = 45^0$ (ii) $A = 45, B = 30$

35. If $\operatorname{cosec} A + \cot A = m$, show that $\dfrac{m^2 - 1}{m^2 + 1} = \cos A$

36. Prove that $(\sec\theta + \tan\theta)^2 = \dfrac{\operatorname{cosec}\theta + 1}{\operatorname{cosec}\theta - 1}$.

37. If $\operatorname{cosec}\theta + \cot\theta = q$, show that $\operatorname{cosec}\theta - \cot\theta = \dfrac{1}{q}$ and hence find the values of $\sin\theta$ *and* $\sec\theta$.

38. Prove that $\frac{\tan A}{\sec A - 1} + \frac{\tan A}{\sec A + 1} = 2\cos ecA$.

39. ΔRPQ is a right angled at Q. If PQ = 5 cm and RQ = 10 cm, find:

(i) $\sin^2 P$ $(ii)\cos^2 R$ $(iii)\sin P \times \cos P$.

40. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$, show that $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$.

41. Show that $\cos ec^2\theta - \tan^2(90 - \theta) = \sin^2\theta + \sin^2(90 - \theta)$.

42. ΔABC is a right angled at C and AC = $\sqrt{2}BC$. Prove that $\angle ABC = 60^0$.

43. Show that $\sqrt{\frac{1+\cos\alpha}{1-\cos\alpha}} = \cos ec\alpha + \cot\alpha$.

44. Evaluate: $\frac{4\cot^2 60 + \sec^2 30 - 2\sin^2 45}{\sin^2 60 + \cos^2 45}$.

45. If $\sec\theta + \tan\theta = p$, then find the value of $\text{cosec}\,\theta$.

46. Evaluate: $\frac{4}{\cot^2 30} + \frac{1}{\sin^2 60} - \cos^2 45$