Board – CBSE | **Class – 10th** | **Topic – Introduction to Trigonometry**

1. Prove that $\frac{1}{SecA} - \frac{tanA-1}{cosA} = \frac{1}{CosA} - \frac{1}{secA+tanA}$

2. If $7sin^2A + 3cos^2A = 4$, show that $tanA = \frac{1}{\sqrt{3}}$

3. If $sinA = cosA$, find the value of $2tan^2A + sin^2A - 1$

4. Show that $cosec^2\theta - tan^2(90^\circ - \theta) = sin^2\theta + sin^2(90^\circ - \theta)$.

5. ABC is a triangle right angled at C and $AC = \sqrt{3}BC$. Prove that $\angle ABC = 60^\circ$

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

7. In an acute angled triangle ABC, if $sin(A + B - C) = \frac{1}{2}$ and $cos(B + C - A) = \frac{1}{\sqrt{2}}$ find $\angle A, \angle B$ and $\angle C$

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

9. Prove that: $(1 + cotA - cosecA)(1 + tanA + secA) = 2$

10. Prove that: $sin\theta(1 + tan\theta) + cos\theta(1 + cot\theta) = sec\theta + cosec\theta$

11. If $secA = x + \frac{1}{4x}$, prove that $secA + tanA = 2x$ or $\frac{1}{2x}$

12. If $sec\theta - tan\theta = x$, show that: $sec\theta = \frac{1}{2\left(\frac{x+1}{x}\right)}$ and $tan\theta = \frac{1}{2\left(\frac{x-1}{x}\right)}$

13. Given that $cos(A - B) = cosA \cdot cosB + sinA \cdot sinB$, find the value of $cos15^\circ$ in two ways.

(a) Taking $A = 60^\circ, B = 45^\circ$ and

(b) Taking $A = 45^\circ, B = 30^\circ$

14. If $sin\theta = \frac{12}{13}, 0^\circ < \theta < 90^\circ$, find the value of: $\frac{sin^2\theta - cos^2\theta}{2sin\theta \cdot cos\theta} \times \frac{1}{tan^2\theta}$

15. Prove that: $(sec\theta + tan\theta)^2 = \frac{cosec\theta + 1}{cosec\theta - 1}$

16. Evaluate: $\frac{4}{Cot^2 30^\circ} + \frac{1}{sin^2 60^\circ - cos^2 45^\circ}$

17. Evaluate: $4\left(sin430^\circ + cos460^\circ\right) - 3\left(cos^2 45^\circ - sin^2 90^\circ\right)$

18. Prove that $\frac{1}{cosecA + cotA} - \frac{1}{sinA} = \frac{1}{sinA} - \frac{1}{cosecA - cotA}$

19. In an acute angled triangle ABC, if $sin(A + B - C) = \frac{1}{2}$ and $cos(B + C - A) = \frac{1}{\sqrt{2}}$ $\angle A, \angle B$ and $\angle C$

20. Determine the value of x such that $2cosec^2 30^\circ + xsin^2 60^\circ - \frac{3}{4tan^2 30} = 10$