Subject – Maths. Class- 10th Topic – Ch. 7 Trigonometric Identities

Refer to Video #8, 9 & 10 and solve the following exercise:

EXERCISE 7.1

14. $\frac{1-\tan^2\alpha}{\cot^2\alpha-1}=\tan^2\alpha$

15. $\frac{\sin\theta}{1-\cos\theta}=\frac{1+\cos\theta}{\sin\theta}$

16. $\sin^6\theta+\cos^6\theta=1-3\sin^3\theta\cos^2\theta$

17. $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\tan\theta+\cot\theta$

18. $\sin\theta(1+\tan\theta)+\cos\theta(1+\cot\theta)=\operatorname{cosec}\theta+\sec\theta$

19. $\sin^2\theta\cos\theta+\tan\theta\sin\theta+\cos^3\theta=\sec\theta$

20. $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta\operatorname{cosec}\theta$

21. $(\sin A+\operatorname{cosec} A)^2+(\cos A+\sec A)^2=7+\tan^2A+\cot^2A$

22. $\sin^8\theta-\cos^8\theta=(\sin^2\theta-\cos^2\theta)(1-2\sin^2\theta\cos^2\theta)$

23. $\sqrt{\frac{\sec\theta+1}{\sec\theta-1}}=\cot\theta+\operatorname{cosec}\theta$

11. $\cot\theta-\tan\theta=\frac{}{\sin\theta\cos\theta}$

12. $\cos^4\theta+\sin^4\theta=1-2\cos^2\theta\sin^2\theta$

13. $(\sec\theta-\cos\theta)(\cot\theta+\tan\theta)=\tan\theta\sec\theta$

14. $\dfrac{1-\tan^2\alpha}{\cot^2\alpha-1}=\tan^2\alpha$

15. $\dfrac{\sin\theta}{1-\cos\theta}=\dfrac{1+\cos\theta}{\sin\theta}$

16. $\sin^6\theta+\cos^6\theta=1-3\sin^3\theta\cos^2\theta$

17. $\dfrac{\tan\theta}{1-\cot\theta}+\dfrac{\cot\theta}{1-\tan\theta}=1+\tan\theta+\cot\theta$

18. $\sin\theta(1+\tan\theta)+\cos\theta(1+\cot\theta)=$
$\operatorname{cosec}\theta+\sec\theta$

19. $\sin^2\theta\cos\theta+\tan\theta\sin\theta+\cos^3\theta=\sec\theta$

20. $\dfrac{\tan\theta}{1-\cot\theta}+\dfrac{\cot\theta}{1-\tan\theta}=1+\sec\theta\operatorname{cosec}\theta$

21. $(\sin A+\operatorname{cosec} A)^2+(\cos A+\sec A)^2=$
$7+\tan^2A+\cot^2A$

22. $\sin^8\theta-\cos^8\theta=(\sin^2\theta-\cos^2\theta)(1-2\sin^2\theta\cos^2\theta)$

23. $\sqrt{\dfrac{\sec\theta+1}{\sec\theta-1}}=\cot\theta+\operatorname{cosec}\theta$

24. $\dfrac{(1+\cot\theta+\tan\theta)(\sin\theta-\cos\theta)}{\sec^3\theta-\operatorname{cosec}^3\theta}=\sin^2\theta\cos^2\theta$

25. $\dfrac{\sin\theta+\cos\theta}{\sin\theta-\cos\theta}+\dfrac{\sin\theta-\cos\theta}{\sin\theta+\cos\theta}=\dfrac{2}{1-2\cos^2\theta}=\dfrac{2}{2\sin^2\theta-1}$

26. $\dfrac{\cos A}{1-\tan A}+\dfrac{\sin A}{1-\cot A}=\sin A+\cos A$

27. $(\operatorname{cosec} A-\sin A)(\sec A-\cos A)=\dfrac{1}{\tan A+\cot A}$

28. $\dfrac{\cos^2\theta}{1-\tan\theta}+\dfrac{\sin^3\theta}{\sin\theta-\cos\theta}=1+\sin\theta\cos\theta$

29. If $\sec\theta+\tan\theta=P$, then prove that $\dfrac{P^2-1}{P^2+1}=\sin\theta$

30. If $\dfrac{\cos A}{\cos B}=m$ and $\dfrac{\cos A}{\sin B}=n$, then prove that $(m^2+n^2)\cos^2B=n^2$