1. What is the value of $\sin \dfrac{31\pi}{3}$. 1

2. Find the value of sin 75° cos 15° + cos 75° sin 15° 1

3. Express the following as sum or difference : cos 5θ cos 3θ 1

4. Express each of the following as a product : sin 32° + sin 54° 1

5. Find the value $\operatorname{cosec}\left(\dfrac{-19\pi}{3}\right)$. 2

6. Solve the equation $2\cos \dfrac{3x}{5} - 1 = 0$. 2

7. Evaluate, sin 105° + cos 105°. 2

8. Find the value of $2\sin^2 \dfrac{3\pi}{4} + 2\cos^2 \dfrac{3\pi}{4} - 2\tan^2 \dfrac{3\pi}{4}$. 2

9. What is the value of $\cos\left(\dfrac{\pi}{4}-x\right)\cos\left(\dfrac{\pi}{4}-y\right)-\sin\left(\dfrac{\pi}{4}-x\right)\sin\left(\dfrac{\pi}{4}-y\right)$? 2

10. A train is travelling on a curve of 700 m radius at 14 km/h, Through what angle will it turn in one minute ? 2

11. If the angular diameter of the moon be 30', how far from the eye a coin of diameter 2.2 cm be kept to hide the moon ? 2

12. Find the value of the following : tan (− 1125°) 2

13. In triangle ABC, prove that : cos (A + B) + cos C = 0. 2

14. In triangle ABC, prove that : $\sin\left(\dfrac{A+B}{2}\right) = \cos \dfrac{C}{2}$ 2

15. In quadrilateral ABCD, prove that : cos (A + B) = cos (C + D). 2

16. Find the principal solution of the equation: $\sin x = \dfrac{1}{2}$ 2

17. Find the principal solution of the equation: $\cos x = \dfrac{\sqrt{3}}{2}$. 2

18. If $\sin x = \dfrac{3}{5}$, $\cos y = \dfrac{-12}{13}$ and x, y both lie in the second quadrant, find the values of $\sin (x + y)$ 4

19. Prove that $\sqrt{2+\sqrt{2+2\cos 4x}} = 2\cos x, 0 < x < \dfrac{\pi}{4}$.   4

20. Solve the equation $\cos 3x = \sin 2x$ 4

21. In $\triangle ABC$, prove that $\dfrac{\sin (B-C)}{\sin (B+C)} = \dfrac{b^2 - c^2}{a^2}$.   4

22. In $\triangle ABC$, prove that $\dfrac{\cos A}{a} + \dfrac{\cos B}{b} + \dfrac{\cos C}{c} = \dfrac{a^2 + b^2 + c^2}{2abc}$.   4

23. Prove that, $\cos 20° \cos 40° \cos 60° \cos 80° = \dfrac{1}{16}$.   4

24. Solve for x : $\tan^2 x + \cot^2 x = 2$ 4

25. Solve the equation for general solution $2 \sin^2 x + \sin^2 2x = 2$.   4

26. Solve : $2 \cos^2 x + 3 \sin x = 0$.   4

27. Prove the following identitie : $\dfrac{\tan (A+B)}{\cot (A-B)} = \dfrac{\sin^2 A - \sin^2 B}{\cos^2 A - \sin^2 B}$ 4

28. Find the general solution of the equation : $2 \tan x - \cot x + 1 = 0$ 4

29. Find the general solution of the equation : $\cot^2 x + 3 \csc x + 3 = 0$ 4

30. $\tan^2 x + (1 - \sqrt{3})\tan x - \sqrt{3} = 0$ 4

31. In $\triangle ABC$, prove that : $\tan \dfrac{A-B}{2} = \dfrac{a-b}{a+b} \cot \dfrac{C}{2}$ 4

32. In $\triangle ABC$, prove that : $\dfrac{\sin B}{\sin C} = \dfrac{c - a \cos B}{b - a \cos C}$ 4

33. In $\triangle ABC$, prove that : $\dfrac{a \sin (B-C)}{b^2 - c^2} = \dfrac{b \sin (C-A)}{c^2 - a^2} = \dfrac{c \sin (A-B)}{a^2 - b^2}$ 4

34. Find the general solution of the equation, $2 \sin x + \sqrt{3} \cos x = 1 + \sin x$.   6

35. In $\triangle ABC$, prove that : $a^3 \sin (B - C) + b^3 \sin (C - A) + c^3 \sin (A - B) = 0$ 6

36. $\dfrac{b^2 - c^2}{a^2} \sin 2A + \dfrac{c^2 - a^2}{b^2} \sin 2B + \dfrac{a^2 - b^2}{c^2} \sin 2C = 0$ or $\sum \dfrac{b^2 - c^2}{a^2} \sin 2A = 0$.   6