

TRIGNOMETRY

1. Prove that

$$\sin 20^\circ \cdot \sin 40^\circ \cdot \sin 60^\circ \cdot \sin 80^\circ = 3/16$$

2. Prove that

$$\cos 15^\circ \cos 30^\circ \cos 45^\circ \cos 60^\circ \cos 75^\circ = 3/16$$

3. Express as Product

1) $\sin 5x + \sin 3x$

2) $\cos 6x - \cos 8x$

3) $\sin 2x - \sin 4x$

4) $\cos x + \cos 7x$

3. Express as the sum

1) $2 \sin x \sin 3x$

2) $\cos x \sin 2x$

3) $4 \sin 6x \sin 2x$

4. Prove that

$$\sin^2 \pi/6 + \cos^2 \pi/3 - \tan^2 \pi/4 = -1/2$$

5. $2 \sin^2 \pi/6 + \operatorname{cosec}^2 7\pi/6 \cdot \cos^2 \pi/3 = 3/2$

6. Find the value of

1) $\sin 75^\circ$

2) $\tan 15^\circ$

7. Prove that

$$\cos(n+1)x \cos(n+3)x + \sin(n+1)x \sin(n+3)x = \cos x$$

8. Prove that

$$\sin 5x + \sin 3x / \cos 5x + \cos 3x = \tan 4x$$

9. Prove that

$$\frac{\cos 4x + \cos 2x + \cos 3x}{\sin 4x + \sin 2x + \sin 3x} = \cot 3x$$

$$10. \tan 4x = 4 \tan x \frac{(1 - \tan^2 x)}{1 - 6 \tan^2 x + \tan^4 x}$$

11. Prove that

$$(\sin 3x - \sin x) / (\cos^2 x - \sin^2 x) = 2 \sin x$$

$$12. \cos 9x - \cos 5x / \sin 17x - \sin 3x = -\sin 2x / \cos 10x$$

13. Prove that

$$(1 - \cos 4x) + \sin 4x / (1 + \cos 4x) + \sin 4x = \tan 2x$$

$$14. (\sin x + \sin y)^2 + (\cos x + \cos y)^2 = 4 \cos^2(x - y/2)$$

15. Prove that

$$\tan(60 - x) \cdot \tan x \cdot \tan(60 + x) = \tan 3x.$$

16. Prove that

$$\cos^2 n + \cos^2(n + \pi/3) + \cos^2(n - \pi/3) = 3/2$$

17. Find the value of $\tan(\pi/8)$

18. Prove that

$$\cos 2x \cos x/2 - \cos 3x \cos 9x/2 = \sin 5x \cdot \sin 5x/2$$

19. Prove that

$$\cos 4x = 1 - 8 \sin^2 x \cdot \cos^2 x$$

20. Prove

$$\cos 6x = 32 \cos^6 x - 48 \cos^4 x + 18 \cos^2 x - 1$$

21. Prove that

$$\cos((3\pi/4) + x) - \cos((3\pi/4) - x) = -\sqrt{2} \sin x$$

22. Prove that

$$\frac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x} = 2 \sin x$$

23. Find the value of

$$\sin 765^\circ$$

$$\cos(-1410^\circ)$$

24. Find the value of

1) $\cot((-15\pi)/4)$

2) $\sin((-11\pi)/2)$

25. If $\tan x = -5/12$, $x \in 4^{\text{th}}$. Find other trigonometrical function

26. Find the value of $\cos(-1710^\circ)$

27. Convert into radian

1) $40^\circ 20'$

2) $-47^\circ 30'$

28. Convert into degree

1) $11/6$

2) -4

29. A wheel makes 360 revolution in 1 minute. Through how many radian does it turn in one second.
