

MATHS

BOOKS - KC SINHA MATHS (HINGLISH)

**TRIGONOMETRIC EQUATIONS - FOR
BOARDS**

Solved Examples

1. Find the principal solution of the following

equation : $\sin \theta = -\frac{1}{2}$



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2. Find the principal solution of the following equation : $\sec x = 2$



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3. Find the principal solution of the following equation : $\cot x = -\sqrt{3}$



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4. Solve the following trigonometric equation :

$$\cos 5\theta = 0$$



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5. Solve the following trigonometric equation :

$$\sin^3 3\theta = 0$$



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6. Solve the following trigonometric equation :

$$\tan nx = 0$$



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7. Solve the following trigonometric equation :

$$\cot^2 px = 0$$



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8. Find the mos general values of θ satisfying the equation : $\sin \theta = -1$



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9. Find the mos general values of θ satisfying the equation : $\cos \theta = -\frac{1}{2}$



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10. Find the most general values of θ satisfying the equation : $\tan \theta = -\sqrt{3}$



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11. Solve the trigonometric equation :

$$\sin 2\theta = \frac{1}{2}$$



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12. Solve the trigonometric equation :

$$\cos 5\theta = -\frac{1}{2}$$



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13. Solve the equation

$$\cot x + \tan x = 2 \cos ex.$$



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14. Solve $7 \cos^2 \theta + 3 \sin^2 \theta = 4$.



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15. Solve the equation $\sec x = \sec(x + \pi)$



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16.

Solve

$$\tan x + \tan 2x + \sqrt{3} \tan x \tan 2x = \sqrt{3}$$



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17. Solve that following equations :

$$\tan \theta + \tan\left(\theta + \frac{\pi}{3}\right) + \tan\left(\theta + \frac{2\pi}{3}\right) = 3$$



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18. Solve $\sin 5x = \cos 2x$.



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19. Solve the equation

$$\tan 2x = -\cot\left(x + \frac{\pi}{6}\right).$$



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20. If $3\tan(\theta - 15^\circ) = \tan(\theta + 15^\circ)$



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21. Solve the equation : $\sin^2 \theta = \sin^2 \alpha$



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22. Solve the equation : $\cos^2 \theta = \cos^2 \alpha$



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23. Solve the equation : $\tan^2 \theta = \tan^2 \alpha$



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24. If $\tan(\cot x) = \cot(\tan x)$, prove that :

$$\sin 2x = \frac{4}{(2n + 1)\pi}$$



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25. If $(1 + \tan A)(1 + \tan B) = 2$, find all values of $A + B$.



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26. Solve the equation :

$$\sin(x - y) = \frac{\sqrt{3}}{2} \text{ and } \cos(x + y) = \frac{1}{2}$$



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27. Solve the equation

$$\sin x \tan x - 1 = \tan x - \sin x.$$



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28. Solve the equation $2 \tan \theta - \cot \theta + 1 = 0$



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29. Solve the equation $\sin mx + \sin nx = 0$



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30. Solve the equation $\sin 9\theta = \sin \theta$



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31. Solve the equation $\sec^2 2x = 1 - \tan 2x$.



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32. Find the general solution for each of the following equation:

$$\sin x + \sin 3x + \sin 5x = 0$$



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33. Solve the equation

$$4\sin x \cos x + 2\sin x + 2\cos x + 1 = 0$$



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34. Most general value of θ satisfying equation

$$\tan^2 \theta + \sec 2\theta = 1$$
 is



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35. Solve the equation $\tan x + \sec x = 2 \cos x$



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36. Solve the equation

$$4 \cos x - 3 \sec x = \tan x.$$



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37.

Solve

$$2 \sin^2 x - 5 \sin x \cos x - 8 \cos^2 x = -2$$



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38. Solve $\cos \theta \cos 2\theta \cos 3\theta = \frac{1}{4}$



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39. Solve $4 \sin x \sin 2x \sin 4x = \sin 3x$.



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40. Solve the equation

$$(1 - \tan \theta)(1 + \sin 2\theta) = 1 + \tan \theta$$



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41. Solve $\sin x + \sqrt{3} \cos x = \sqrt{2}$



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42. Solve the equation :

$$2 \sin x + \sqrt{3} \sin x = 0$$



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Exercise

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



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2. Find the principal solution of the trigonometric equation: $\tan x = -1$



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3. Find the principal solution of the trigonometric equation: $\sin x = -\frac{\sqrt{3}}{2}$



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4. Find the principal solution of the trigonometric equation: $\tan x = \frac{1}{\sqrt{3}}$



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5. Find the principal solution of the trigonometric equation: $\cot x = \frac{1}{\sqrt{3}}$



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6. Find the principal solution of the trigonometric equation: $\cos ex = -2$



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7. Find the principal solution of the trigonometric equation: $\tan x = -\sqrt{3}$



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8. Find the principal solution of the trigonometric equation: $\sec x = -\frac{2}{\sqrt{3}}$



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9. Find the principal solution of the trigonometric equation: $\tan x = \sqrt{3}$



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10. Find the principal solution of the trigonometric equation: $\sin x = \frac{\sqrt{3}}{2}$



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11. Find the principal solution of the trigonometric equation: $\tan x = -\frac{1}{\sqrt{3}}$



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12. Find the principal solution of the trigonometric equation: $\cos ex = 2$



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13. Find the general solution of the trigonometric equation : $\tan 5x = 0$



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14. Find the general solution of the trigonometric equation : $\sin 3x = 0$



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15. Find the general solution of the trigonometric equation : $\sin^2 2x = 0$



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16. Find the general solution of the trigonometric equation : $\cot 4x = 0$



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17. Find the general solution of the trigonometric equation : $\cos^3 4x = 0$



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18. Find the general solution of the trigonometric equation : $\cot^2 5\theta = \theta$



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19. Find the general solution of the trigonometric equation : $\sin \theta = \frac{\sqrt{3}}{2}$



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20. Find the general solution of the trigonometric equation : $\tan 3\theta = -1$



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21. Find the general solution of the trigonometric equation : $\sec 2\theta = -2$



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22. Find the general solution of the trigonometric equation : $\cos \theta = -\frac{\sqrt{3}}{2}$



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23. Find the general solution of the trigonometric equation : $\cos 5x = -\frac{1}{\sqrt{2}}$



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24. Find the general solution of the trigonometric equation : $\sin 3x = \frac{1}{\sqrt{2}}$



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25. Find the general solution of the trigonometric equation : $\cos x = \frac{1}{2}$



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26. Find the general solution of the trigonometric equation : $\sin x = -\frac{\sqrt{3}}{2}$



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27. Solve the trigonometric equation :

$$3 \cos^2 \theta + 7 \sin^2 \theta = 4$$



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28. Solve the trigonometric equation :

$$\tan x + \tan 2x + \tan x \tan 2x = 1$$



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29. Solve the trigonometric equation :

$$\cos 4x = \cos 2x$$



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30. Solve the trigonometric equation :

$$\tan x + \tan 2x + \tan 3x = \tan x \tan 2x \tan 3x$$



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31. Solve the trigonometric equation :

$$\sin 3x + \cos 2x = 0$$



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32. Solve the trigonometric equation :

$$\tan\left(\frac{\pi}{4} + \theta\right) + \tan\left(\frac{\pi}{4} - \theta\right) = 4$$



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33. Solve the trigonometric equation :

$$\tan 2x = -\cot\left(x + \frac{\pi}{3}\right)$$



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34. Solve the equation : $\sin ax + \cos bx = 0$



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35. Solve the equation : $\tan x \tan 4x = 1$



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36. Solve the equation :

$$\cos \theta = \sin 105^\circ + \cos 105^\circ$$



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37. Solve the equation : $\tan x + \cot x = 2$



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38. Solve the equation : $\tan^2 x + \cot^2 x = 2$



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39. Solve the equation $\sec^2 2x = 1 - \tan 2x$.



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40. Find the general solution of the trigonometric equation: $\sin 2x + \cos x = 0$



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41. Find the general solution of the trigonometric equation: $\tan^3 x - 3 \tan x = 0$



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42. Find the general solution of the trigonometric equation: $2\cos^2 x + 3\sin x = 0$



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43. Find the general solution of the trigonometric equation:
 $\cos 3x + \cos x - 2\cos x = 0$



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44. Find the general solution of the trigonometric equation:

$$\sin 2x + \sin 4x + \sin 6x = 0$$



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45. Find the general solution of the trigonometric equation:

$$\sin x + \sin 3x + \sin 5x = 0$$



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46. Find the general solution of the trigonometric equation:

$$\sin 2x - \sin 4x + \sin 6x = 0$$



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47. Find the general solution of the trigonometric equation:

$$\cos 3x + \cos x - 2 \cos x = 0$$



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48. Solve the trigonometric equation :

$$\sqrt{3} \cos x - \sin x = 1$$



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49. Solve the trigonometric equation :

$$\cos \theta - \sin \theta = -1$$



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50. Solve the trigonometric equation :

$$\cos x + \sin x = 1$$



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51. Solve the trigonometric equation :

$$\sec x - \tan x = \sqrt{3}$$



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52. Solve the trigonometric equation :

$$\sqrt{2} \sec x + \tan x = 1$$



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53. Solve the trigonometric equation :

$$\cot x + \cos ecx = \sqrt{3}$$



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54. Solve the trigonometric equation :

$$\sin x + \cos x = \frac{1}{\sqrt{2}}$$



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55. Solve the trigonometric equation :

$$\cos x + \sqrt{3} \sin x = 1$$



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