



MATHS

BOOKS - KC SINHA ENGLISH

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 and general solution of

$$\sec x = 2$$



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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 most general values of θ satisfying the equation : $\sin \theta = -1$



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9. Find the general value of θ

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



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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 $\tan \theta + \tan 2\theta + \sqrt{3} \tan \theta \tan 2\theta = \sqrt{3}$.



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17. Solve that following equations :

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



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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 $3\tan(\theta - 15^\circ) - \tan(\theta + 15^\circ) = 0$. Find θ .



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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 $\tan(\cot \theta) = \cot(\tan \theta)$, then prove that:

$$\pi(2n + 1)\sin 2\theta = 4$$



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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 : $\sin 9\theta = \sin \theta$.



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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. The general value of θ satisfying the equation

$$\tan^2 \theta + \sec 2\theta = 1 \text{ is } \underline{\hspace{2cm}}$$



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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 $\cos \theta \cdot \cos 2\theta \cdot \cos 3\theta = \frac{1}{4}$, $0 \leq \theta \leq \pi$



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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: $\tan x = \frac{1}{\sqrt{3}}$



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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: $\cot x = -\sqrt{3}$



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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 equation

$$\sin x = \frac{\sqrt{3}}{2}.$$



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11. Find the principal solution of the equation

$$\tan x = -\frac{1}{\sqrt{3}}.$$



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



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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 : $\sin^2 2x = 0$



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



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16. Find the general solution of the trigonometric equation : $\cot^2 5\theta = 0$



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17. Find the general solutions of the following

equation: $s \int h \eta = \frac{\sqrt{3}}{2}$



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18. Solve the following trigonometric equation:

$$\tan 3\theta = -1$$



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



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20. Find the general solutions of the following equation: $\cos \theta = -\frac{\sqrt{3}}{2}$



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



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22. Find the general solution of the trigonometric

$$\text{equation : } \sin 3x = \frac{1}{\sqrt{2}}$$



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23. Find the general solution of the trigonometric

$$\text{equation : } \cos x = \frac{1}{2}$$



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24. Find the general solution of the trigonometric

equation : $\sin x = -\frac{\sqrt{3}}{2}$



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25. Solve the trigonometric equation :

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



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26. Solve the trigonometric equation :

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



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27. Find the general solution : $\cos 4x = \cos 2x$



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28. Solve the trigonometric equation :

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



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29. Solve the trigonometric equation :

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



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



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31. Solve the trigonometric equation :

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



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



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



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34. Solve the equation :

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



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



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



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



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38. Find the general solution :

$$s \in 2x + \cos x = 0$$



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39. Find the general solution of the trigonometric

equation: $\tan^3 x - 3 \tan x = 0$



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



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



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42.

Solve

$s \in$

$2x$

$s \in$

$4x$

$+$

$s \in$

$6x$

$=$

0



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43. Find the general solution :

$$s \in x + s \in 3x + s \in 5x = 0$$



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



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



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