MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

TRIGONOMETRIC EQUATIONS

Saq

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

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

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3. Solve $\cot x + \operatorname{cosec} x = \sqrt{3}$

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4. Solve $\tan\theta + \sec\theta = \sqrt{3}, 0 < \theta \leq 2\pi$

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

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6. Solve $2\cos^2\theta - \sqrt{3}\sin\theta + 1 = 0.$

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7. Solve $\cos 2\theta + \cos 8\theta = \cos 5\theta$

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8. Solve $\sin\theta + \sin 5\theta = \sin 3\theta, 0 < \theta < \pi.$

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9. Solve $\sin 2x - \cos 2x = \sin x - \cos x$

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10. Solve $1 + \sin 2x = (\sin 3x - \cos 3x)^2$

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11. Solve $1 + \sin^2\theta = 3\sin\theta\cos\theta$

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12. Solve $\tan\theta + 3\cot\theta = 5\sec\theta$.

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13. If $a\cos 2\theta + b\sin 2\theta = c$ has θ_1, θ_2 as its solutions then show that $\tan\theta_1 + \tan\theta_2 = \frac{2b}{c+a}$ $\tan\theta_1 . \tan\theta_2 = \frac{c-a}{c+a}$ and hence show that $\tan(\theta_1 + \theta_2) = b/a$.

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14. If α, β are the solutions of the equation $a\cos\theta + b\sin\theta = c$, where $a, b, c \in R$ and if $a^2 + b^2 > 0, \cos\alpha \neq \cos$

then S.T

$$\sin\alpha + \sin\beta = \frac{2bc}{a^2 + b^2}$$

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15. If α, β are the solutions of the equation $a\cos\theta + b\sin\theta = c$, where $a, b, c \in R$ and if $a^2 + b^2 > 0, \cos\alpha \neq \cos$ then show that (i) $\sin\alpha + \sin\beta = \frac{2bc}{a^2 + b^2}$ (ii) $\sin\alpha . \sin\beta = \frac{c^2 - a^2}{a^2 + b^2}$

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16. Given $p \neq \pm q$. Show that the solutions of $\cos P\theta + \cos q\theta = 0$ form two series each of which is in A.P . Find also the common difference of each A.P .

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17. Find all values of x in $(-\pi, \pi)$ satisfying the equation $8^{1+\cos x+\cos^9(2)x+\ldots} = 4^3$.

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18. If $x + y = \frac{2\pi}{3}$ and $\sin x + \sin y = \frac{3}{2}$ then find x, y

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19. If $\tan(\pi \cos\theta) = \cot(\pi \sin\theta)$, then prove that $\cos\left(\theta - \frac{\pi}{4}\right) = \pm \frac{1}{2\sqrt{2}}$

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

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21. If $0 < \theta < \pi$, then solve $\cos\theta . \cos 2\theta . \cos 3\theta = 1/4$

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22. If $\cos 3x + \cos 2x = \sin(3x/2) + \sin(x/2), 0 \leq x \leq 2\pi$, then x =

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23. If x is acute and $\sin(x + 10^\circ) = \cos(3x - 68^\circ)$ then find x .

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24. Solve $4\cos^2\theta + \sqrt{3} = 2\left(\sqrt{3} + 1\right)\cos\theta$

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25. Solve $2\sin^2 x + \sin^2 2x = 2$

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Spq

1. Solve $5\cos^2\theta + 7\sin^2\theta = 6$

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2. Solve $2\cos^2\theta + 11\sin\theta = 7.$

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3. If $0 < x < \frac{\pi}{2}$ then solve $\cot^2 x - \left(\sqrt{3}+1\right)\cot x + \sqrt{3} = 0$

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4. Solve $\cos\theta\cos 7\theta\sin 4\theta$

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5. Solve $\cos 3x - \cos 4x = \cos 5x - \cos 6x$

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6. If α, β are the solutions of the equation $a\cos\theta + b\sin\theta = c$, where $a, b, c \in R$ and if $a^2 + b^2 > 0, \cos\alpha \neq \cos$ then show that (i) $\sin\alpha + \sin\beta = \frac{2bc}{a^2+b^2}$ (ii) $\sin\alpha.\sin\beta = \frac{c^2-a^2}{a^2+b^2}$

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7. Show that the solutions $\cos p\theta = \sin q\theta$ from two series each of which is an A.P. Find also the common difference of each A.P $(p \neq \pm q)$

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8. If $\tan p\theta = \cot q\theta$ and $p \neq q$ show that the solutions are in A.P with common difference $\frac{\pi}{p+q}$

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