



MATHS

BOOKS - PATHFINDER MATHS (BENGALI ENGLISH)

MEASUREMENT OF ANGLES & TRIGONOMETRIC FUNCTIONS

Question Bank

1. If $\tan \theta = \frac{4}{3}$ and θ lies in the 3rd quadrant, find the value of $\sec \theta$.

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2. Prove that $\tan^2 \theta - \sin^2 \theta = \tan^2 \theta \cdot \sin^2 \theta$

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3. Express 25° as radian measurement.

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4. In a right angular triangle the difference between two acute angles is $\frac{\pi}{18}$ radian. Find the angles in degrees.

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

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6. Prove that $\cot^2 60^\circ + \sin^2 45^\circ + \sin^2 30^\circ + \cos^2 90^\circ = \frac{13}{12}$

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7. Solve for x : $\sin \theta = x + \frac{1}{x}$, $x \in R$.

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8. Prove that $\frac{(\sin 0^\circ + \cos 30^\circ)(\sin 30^\circ + \tan 45^\circ)}{(\tan 30^\circ + \cot 60^\circ)(\sec 60^\circ - \csc 90^\circ)} = \frac{9}{8}$.

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9. Prove that

$$\cos^2\left(\frac{\pi}{8}\right) + \cos^2\left(\frac{3\pi}{8}\right) + \cos^2\left(\frac{5\pi}{8}\right) + \cos^2\left(\frac{7\pi}{8}\right) = 2.$$

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10. Evaluate $\cos^2\left(\frac{\pi}{3}\right) + \sin^2\left(\frac{\pi}{6}\right) - \tan^2\left(\frac{\pi}{4}\right)$

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11. Find the degree measure of the angle subtended at the centre of a circle of radius 100 cm by an arc of length 22 cm (Use $\pi = \frac{22}{7}$).

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12. Prove that $\cos 510^\circ \cos 330^\circ + \sin 390^\circ \cos 120^\circ = -1$

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13. Evaluate $\cos ec(-1200^\circ)$.

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14. In a $\triangle ABC$. Prove that $\cos(A+B) + \cos C = 0$.



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15. Find x if $\cos ec(90^\circ + \theta) + x \cos \theta \cot(90^\circ + \theta) = \sin(90 + \theta)$



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16. Prove that

$$\left(\frac{1}{\sec^2 \theta - \cos^2 \theta} + \frac{1}{\cos ec^2 - \sin^2 \theta} \right) \sin^2 \theta \cos^2 \theta = \frac{1 - \sin^2 \theta \cos^2 \theta}{2 + \sin^2 \theta \cos^2 \theta}$$



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17. If $(\cos ec\alpha - \cot \alpha)(\cos ec\beta - \cot \beta)(\cos ec\gamma - \cot \gamma) = (\cos ec\alpha + \cot \alpha)(\cos ec\beta + \cot \beta)(\cos ec\gamma + \cot \gamma)$, Prove that each side equals to ± 1



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18. If $\frac{ax}{\cos \theta} + \frac{by}{\sin \theta} = a^2 - b^2$ and $\frac{ax \sin \theta}{\cos^2 \theta} - \frac{by \cos \theta}{\sin^2 \theta} = 0$, Prove that $(ax)^{2/3} + (by)^{2/3} = (a^2 - b^2)^{2/3}$

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19. If $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$, Prove that $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$

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20. If $T_n = \sin^n \theta + \cos^n \theta$ Prove that $\frac{T_3 - T_5}{T_1} = \frac{T_5 - T_7}{T_3}$

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21. The angular diameter of the moon 30' . How far from the eye a coin of diameter 2.2cm be kept to hide the moon ?

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22. If $\tan^2 \theta = 1 - e^2$, Prove that $\sec \theta + \tan^3 \theta \cos ec \theta = (2 - e^2)^{3/2}$

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23. Prove that $\cos \theta (\tan \theta + 2)(2 \tan \theta + 1) = 2 \sec \theta + 5 \sin \theta$

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24. Prove that $\sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} + \sqrt{\frac{1 + \sin \theta}{1 - \sin \theta}} = \frac{2}{\cos \theta}$ where $\frac{\pi}{2} < \theta < \pi$.

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25. If $\tan \theta = \frac{a}{b}$, show that $\frac{a \sin \theta - b \cos \theta}{a \sin \theta + b \cos \theta} = \frac{a^2 - b^2}{a^2 + b^2}$



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