doubtnut
India's Number 1 Education App

MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

TRIGONOMETRY

Convert The Following Into Degrees

1. $\frac{\pi^c}{3} = \frac{180^\circ}{3} = 60^\circ$

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2. $\frac{\pi^c}{6} = \frac{180^\circ}{6} = 30^\circ$

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3. $\frac{\pi^c}{3} = \frac{180^\circ}{3} = 60^\circ$

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4. $\frac{\pi^c}{6} = \frac{180^\circ}{6} = 30^\circ$

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5. $\frac{\pi^c}{3} = \frac{180^\circ}{3} = 60^\circ$

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6. $\frac{\pi^c}{6} = \frac{180^\circ}{6} = 30^\circ$

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Convet Into Radians

1. $30^\circ = \frac{\pi}{180} \times 30 = \frac{\pi^c}{6}$

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2.

$$22^\circ 30 = \left(22\frac{1}{2}\right) = \left(\frac{45}{2}\right)^\circ = \frac{45}{2} \times \frac{\pi}{180} = \frac{\pi^c}{8}$$

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3. $30^\circ = \frac{\pi}{180} \times 30 = \frac{\pi^c}{6}$

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4.

$$22^\circ 30 = \left(22\frac{1}{2}\right) = \left(\frac{45}{2}\right)^\circ = \frac{45}{2} \times \frac{\pi}{180} = \frac{\pi^c}{8}$$

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One Marks Questions With Answers

1. The angles is a triangle are in the ratio $1:3:5$. Find the magnitude of the greatest angle in radians.

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2. Find the radians the interior angle of a regular pentagon.

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3. On a circle of radius 2 cm, find the length of the arc subtending an angle of 15°.

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4. The length of an arc of a circle of radius 25 cm is 32 cm. Find the angle subtended by the arc at the centre of the circle.

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5. The angles is a triangle are in the ratio $1:3:5$. Find the magnitude of the greatest angle in radians.

Watch Video Solution

6. Find in radians the interior angle of a regular pentagon.

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7. On a circle of radius 2 cm, find the length of th are subtending an angle of 15°.

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8. The length of an arc of a circle of radius 25 cm is 32 cm. Find the angle subtended by the arc at the

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9. The angles is a triangle are in the ratio $1:3:5$. Find the magnitude of the greatest angle in radians.

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Two Marks Questions With Answers

1. A wire of length 10 cm is bent so as to form an arc of a circle of radius 4 cm. What is the angle at the centre in circular measure?

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2. A circular wire of radius 6 cm is cut & bent so as to form an arc of a cricle of radius 48 cm. Find the angle in degrees subtended by the arc at the centre.

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3. Convert $40^\circ, 20'$ into radian measure.

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4. Convert 6 radians into degree measure.

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5. Find the radius of the circle in which a central angle of 60° intercepts an arc of length 37.4 cm (use $\pi = \frac{22}{7}$)

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6. The minute hand of a watch is 1.5 cm long. How far foes its tip move in 40 minutes?

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7. If the arc of the same lengths in two circles subtend angles 65° and 110° at the centre, find the ratio of their radii.

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8. A wheel makes 360 revolutions in one minute. Through how many radians does it turn in one second?

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9. 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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10. In a circle of diameter 40 cm, the length of a chord is 20 cm. Find the length of minor arc of the chord.

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11. If in two cirlces arcs of the same length subtend angles 60° and 75° at the centre, find the ratio of their radii.

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12. If $\sin A = \frac{1}{2}$ find $\sin 2A$ & $\cos 2A$

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13. If $\sin A = \frac{3}{5}$, find $\sin 3A$ & $\cos 3A$, A is acute.

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Prove The Following

1. $\cos\theta . \cos ec\theta = \cot\theta$

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2. $(1-\sin(2)A)\left(1+\tan^2 A\right)=1$

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3. $\frac{\sin\theta}{\cos ec\theta}+\frac{\cos\theta}{\sec\theta}=1$

Watch Video Solution

4. $\tan A.\sin A+\cos A=\sec A$

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5. $\tan A + \cot A = \sec A.\ \cos ecA$

Watch Video Solution

6. $\sqrt{\frac{1-\sin A}{1+\sin A}} = \sec A - \tan A$

Watch Video Solution

7. $\cos^4 A - \sin^4 A = 2\cos^2 A - 1$

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8. $\sin^6\theta + \cos^6\theta = 1 - 3\sin^2\theta\cos^2\theta$

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9. $\frac{1-\cos\theta}{\sin\theta} = \frac{\sin\theta}{1+\cos\theta}$

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10. $\frac{\sin^2\theta}{1-\cos\theta} - \frac{\cos^2\theta}{1-\sin\theta} = \cos\theta - \sin\theta$

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11. If $x = r\cos\theta, y = r\sin\theta$ Prove that $x^2 + y^2 = r^2$

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12. $\dfrac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x} = 2\sin x$

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13. $\dfrac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$

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14. $\cot x \cot 2x - \cot 2x \cot 3x - \cot 3x \cot x = 1$

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15. $\tan 4x = \dfrac{4\tan x\left(1 - \tan^2 x\right)}{1 - 6\tan^2 x + \tan^4 x}$

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16. Prove that : $\tan 3x = \dfrac{3\tan x - \tan^3 x}{1 - 3\tan^2 x}$

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17. Prove that:

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18. $\frac{\tan\theta+\sec\theta-1}{\tan\theta-\sec\theta+1}=\frac{1+\sin\theta}{\cos\theta}$

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19. If $2\sin^2\theta+5\cos\theta=4$, Prove that $\cos\theta=1/2$

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20. If $\sec\theta = 13/5$ and θ is acute find $\dfrac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}$

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21. Show that :

$\tan 3x \tan 2x \tan x = \tan 3x - \tan 2x - \tan x$

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22. Prove that :

$\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right) = \sqrt{2}\cos x$

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23. Prove that $= \dfrac{\sin 5x - 2\sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$

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24. $\sin(A+B).\sin(A-B) = \sin^2 A - \sin^2 B$

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25. $\cos(A+B).\cos(A-B) = \cos^2 A - \sin^2 B$

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26. $\tan\left(\frac{\pi}{4}+A\right)=\frac{1+\tan A}{1-\tan A}$

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27. $\tan\left(\frac{\pi}{4}-A\right)=\frac{1-\tan A}{1+\tan A}$

Watch Video Solution

28. $\cot(A-B)=\frac{\cot A.\cot B+1}{\cot B-\cot A}$

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29. $\cot(A-B)=\dfrac{\cot A.\cot B+1}{\cot B-\cot A}$

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30. If $\sin A=3/5, \cos B=5/13$ & A,B are acute, find $\sin(A+B)$

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31. If $\sin A=\dfrac{4}{5}, \cos B=\dfrac{-12}{13}$ and $\dfrac{\pi}{2}<A, B<\pi$, Find $\sin(A-B)$

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32. Prove that

$$\cos(120^\circ + A) + \cos(120^\circ - A) = -\cos A$$

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33. $\frac{\cos 2A}{\sec A} + \frac{\sin 2A}{\cos ecA} = \cos A$

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34. If $\tan A = \frac{1}{2}, \tan(A + B) = \frac{1}{3}$ find tanB.

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35. If $\tan A = \frac{1}{2}, \tan B = \frac{1}{3}$, Prove that $A + B = \frac{\pi}{4}$

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36. $\frac{\sin 2\theta}{1 - \cos 2\theta} = \cot \theta$

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37. $\frac{1 + \cos 2\theta}{\sin 2\theta} = \cot \theta$

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38. $\cos^6 A + \sin^6 A = 1 - \frac{3}{4}\sin^2(2A)$

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39. $\frac{1 - \cos 2A + \sin 2A}{1 + \cos 2A + \sin 2A} = \tan A$

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40. $\frac{\sec 8A - 1}{\sec 4A - 1} = \frac{\tan 8A}{\tan 2A}$

Watch Video Solution

41. $\frac{\sin 3A}{\sin A} - \frac{\cos 3A}{\cos A} = 2$

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42. Prove that $\frac{\sin 3\theta}{1 + 2\cos 2\theta} = \sin\theta$ and hence find $\sin 15^\circ$

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

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44. Prove that : $\sin 3x = 3\sin x - 4\sin^3 x$

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45. Prove that: $\cos 3x = 4\cos^3 x - 3\cos x$

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46. $\cos 130^\circ + \cos 110^\circ + \cos 10^\circ = 0$

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47. $\frac{\sin A - \sin B}{\sin A + \sin B} = \tan\left(\frac{A - B}{2}\right).\cot\left(\frac{A + B}{2}\right)$

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48. $\frac{\cos 75^\circ + \cos 15^\circ}{\sin 75^\circ - \sin 15^\circ} = \sqrt{3}$

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49. $\frac{\sin 6A + \sin 2A + 2\sin 4A}{\sin 7A + \sin 3A + 2\sin 5A} = \frac{\sin 4A}{\sin 5A}$

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50. $\cos A + \cos(120^\circ - A) + \cos(120^\circ + A) = 0$

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51. $\cos^2\theta + \cos^2(60^\circ + \theta) + \cos^2(60^\circ - \theta) = \frac{3}{2}$

Watch Video Solution

52. $4\sin A.\ \sin(60^\circ + A)\sin(60^\circ - A) = \sin 3A$

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53. If $A + B + C = \pi$, Prove that

$$\tan A + \tan B + \tan C = \tan A . \tan B . \tan C$$

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54. $\cos 20^\circ . \cos 40^\circ . \cos 60^\circ . \cos 80^\circ = \frac{1}{16}$

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55. If $A + B + C = \pi$ prove that

$$\tan\frac{A}{2}\tan\frac{B}{2} + \tan\frac{B}{2}\tan\frac{C}{2} + \tan\frac{C}{2}\tan\frac{A}{2} = 1$$

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56. If $A + B + C = \pi$, prove that :

$$\sin 2A + \sin 2B + \sin 2C = 4 \sin A \sin B \sin C$$

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57. Prove that:

$$\sin A + \sin B + \sin C = 4 \cos\left(\frac{A}{2}\right) \cos\left(\frac{B}{2}\right) \cos\left(\frac{C}{2}\right)$$

if A + B +C $=180^\circ$

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58.

$$\cos^2 A + \cos^2 B - \cos^2 C = 1 - 2\sin A \sin B \cos C$$

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59. In ΔABC, prove that $\frac{\sin(B-C)}{\sin(B+C)} = \frac{b^2 - c^2}{a^2}$

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60. $\frac{a^2 - b^2}{c^2 - a^2} = \frac{c}{b} \cdot \frac{\sin(A-B)}{\sin(C-A)}$

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61. $\frac{\cos 2A}{a^2} - \frac{\cos 2B}{b^2} = \frac{1}{a^2} - \frac{1}{b^2}$

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62. $\Sigma a \sin(B - C) = 0$

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63. If $a \sin a = b \sin B$ then prove that ΔABC is isosceles.

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66. Prove that $a^2 + b^2 + c^2 = 2(ab\cos C + bc\cos A + ca\cos B)$

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67. $\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c} = \frac{a^2 + b^2 + c^2}{2abc}$

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68. $\cos\theta . \cos ec\theta = \cot\theta$

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69. $\left(1 - \sin^2 A\right)\left(1 + \tan^2 A\right) = 1$

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$\tan A + \tan B + \tan C = \tan A.\ \tan B.\ \tan C$

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122. If $A+B+C=\pi$ prove that $\tan\frac{A}{2}\tan\frac{B}{2}+\tan\frac{B}{2}\tan\frac{C}{2}+\tan\frac{C}{2}\tan\frac{A}{2}=1$

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144. $\frac{\sin^2\theta}{1-\cos\theta} - \frac{\cos^2\theta}{1-\sin\theta} = \cos\theta - \sin\theta$

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145. If $x = 4\cos\theta, y = r\sin\theta$ Prove that $x^2 + y^2 = r^2$

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146. Prove that: $\frac{\sin x - \sin 3x}{\sin^2 x - \cos^2 x} = 2\sin x$

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147. Prove that: $\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$

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148. $\cot x \cot 2x - \cot 2x \cot 3x - \cot 3x \cot x = 1$

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149. $\tan 4x = \dfrac{4\tan x\left(1 - \tan^2 x\right)}{1 - 6\tan^2 x + \tan^4 x}$

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150. Prove that : $\tan 3x = \dfrac{3\tan x - \tan^3 x}{1 - 3\tan^2 x}$

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151. Prove that:

$$\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\sec\theta\cos ec\theta$$

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152. Prove that: $\frac{\tan\theta+\sec\theta-1}{\tan\theta-\sec\theta+1}=\frac{1+\sin\theta}{\cos\theta}$

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153. If $2\sin^2\theta+5\cos\theta=4$, Prove that $\cos\theta=1/2$

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154. If $\sec\theta = 13/5$ and θ is acute find $\dfrac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}$

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155. Show that :

$\tan 3x \tan 2x \tan x = \tan 3x - \tan 2 - x - \tan x$

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156. Prove that :

$\cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right) = \sqrt{2}\cos x$

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157. Prove that : $\frac{\sin 5x - 2\sin 3x + \sin x}{\cos 5x - \cos x} = \tan x$

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158. $\sin(A+B).\sin(A-B) = \sin^2 A - \sin^2 B$

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159. $\cos(A+B).\cos(A-B) = \cos^2 A - \sin^2 B$

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160. $\tan\left(\frac{\pi}{4}+A\right)=\frac{1+\tan A}{1-\tan A}$

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161. $\tan\left(\frac{\pi}{4}-A\right)=\frac{1-\tan A}{1+\tan A}$

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162. $\cot(A+B)=\frac{\cot A.\cot B-1}{\cot B+\cot A}$

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163. $\cot(A-B)=\dfrac{\cot A.\cot B+1}{\cot B-\cot A}$

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164. If $\sin A=3/5, \cos B=5/13$ & A,B are acute, find $\sin(A+B)$

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165. If $\sin A=\dfrac{4}{5}, \cos B=\dfrac{-12}{13}$ and $\dfrac{\pi}{2}<A, B<\pi$, Find $\sin(A-B)$

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166. Prove that

$$\cos(120^\circ + A) + \cos(120^\circ - A) = -\cos A$$

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167. $\frac{\cos 2A}{\sec A} + \frac{\sin 2A}{\cos ecA} = \cos A$

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168. If $\tan A = \frac{1}{2}, \tan(A + B) = \frac{1}{3}$ find tanB.

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169. If $\tan A = \frac{1}{2}, \tan B = \frac{1}{3}$, Prove that $A + B = \frac{\pi}{4}$

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170. $\frac{\sin 2\theta}{1 - \cos 2\theta} = \cot \theta$

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171. $\frac{1 + \cos 2\theta}{\sin 2\theta} = \cot \theta$

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172. Show that: $\cos^6 A + \sin^6 A = 1 - \frac{3}{4}\sin^2(2A)$

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173. $\frac{1 - \cos 2A + \sin 2A}{1 + \cos 2A + \sin 2A} = \tan A$

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174. $\frac{\sec 8A - 1}{\sec 4A - 1} = \frac{\tan 8A}{\tan 2A}$

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175. $\frac{\sin 3A}{\sin A} - \frac{\cos 3A}{\cos A} = 2$

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176. Prove that $\frac{\sin 3\theta}{1 + 2\cos 2\theta} = \sin\theta$ and hence find $\sin 15^\circ$

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

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178. Prove that : $\sin 3x = 3\sin x - 4\sin^3 x$

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179. Prove that: $\cos 3x = 4\cos^3 x - 3\cos x$

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180. Show that : $\cos 130^\circ + \cos 110^\circ + \cos 10^\circ = 0$

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181. Show that:

$$\frac{\sin A - \sin B}{\sin A + \sin B} = \tan\left(\frac{A - B}{2}\right).\cot\left(\frac{A + B}{2}\right)$$

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182. $\frac{\cos 75^\circ + \cos 15^\circ}{\sin 75^\circ - \sin 15^\circ} = \sqrt{3}$

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183. $\frac{\sin 6A + \sin 2A + 2\sin 4A}{\sin 7A + \sin 3A + 2\sin 5A} = \frac{\sin 4A}{\sin 5A}$

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184. Prove that :

$\cos A + \cos(120^\circ - A) + \cos(120^\circ + A) = 0$

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185. $\cos^2\theta + \cos^2(60^\circ + \theta) + \cos^2(60^\circ - \theta) = \frac{3}{2}$

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186. Show that:

$4\sin A.\ \sin(60^\circ + A)\sin(60^\circ - A) = \sin 3A$

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187. If $A + B + C = \pi$, Prove that

$$\tan A + \tan B + \tan C = \tan A . \tan B . \tan C$$

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188. $\cos 20^\circ . \cos 40^\circ . \cos 60^\circ . \cos 80^\circ = \frac{1}{16}$

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189. If $A + B + C = \pi$ prove that

$$\tan\frac{A}{2}\tan\frac{B}{2} + \tan\frac{B}{2}\tan\frac{C}{2} + \tan\frac{C}{2}\tan\frac{A}{2} = 1$$

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190. If $A + B + C = \pi$, prove that

$\sin 2A + \sin 2B + \sin 2C = 4 \sin A \sin B \sin C.$

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191. Prove that:

$\sin A + \sin B + \sin C = 4 \cos\left(\frac{A}{2}\right) \cos\left(\frac{B}{2}\right) \cos\left(\frac{C}{2}\right)$

if A + B +C =180°

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192.

$$\cos^2 A + \cos^2 B - \cos^2 C = 1 - 2\sin A \sin B \cos C$$

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193. In ΔABC, prove that $\frac{\sin(B-C)}{\sin(B+C)} = \frac{b^2 - c^2}{a^2}$

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194. $\frac{a^2 - b^2}{c^2 - a^2} = \frac{c}{b} \cdot \frac{\sin(A-B)}{\sin(C-A)}$

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195. $\frac{\cos 2A}{a^2} - \frac{\cos 2B}{b^2} = \frac{1}{a^2} - \frac{1}{b^2}$

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196. $\Sigma a \sin(B - C) = 0$

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197. If $a \sin a = b \sin B$ then prove that ΔABC is isosceles.

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198. If $a\cos A = b\cos B$ then prove that ΔABC is eitherisosceles or right angled.

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199. In ΔABC if $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ Prove that ΔABC is equilateral.

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200. Prove that $a^2 + b^2 + c^2 = 2(ab\cos C + bc\cos A + ca\cos B)$

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201. $\frac{\cos A}{a} + \frac{\cos B}{b} + \frac{\cos C}{c} = \frac{a^2 + b^2 + c^2}{2abc}$

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Find The General Solution Of The Following Equation

1. Solve $\sin 2x - \sin 4x + \sin 6x = 0$

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2. Solve $2\cos^2 x + 3\sin x = 0$

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3. $\cos 4x = \cos 2x$

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

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5. $\sin 2x + \cos x = 0$

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6. $\sec^2 2x = 1 - \tan 2x$

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

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8. Solve $\sin 2x - \sin 4x + \sin 6x = 0$

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9. Solve $2\cos^2 x + 3\sin x = 0$

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10. $\cos 4x = \cos 2x$

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

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12. $\sin 2x + \cos x = 0$

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13. $\sec^2 2x = 1 - \tan 2x$

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

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15. Solve $\sin 2x - \sin 4x + \sin 6x = 0$

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16. Find the general solutions of $2\cos^2 x - 3\sin x = 0$

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17. $\cos 4x = \cos 2x$

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

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19. $\sin 2x + \cos x = 0$

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20. Find the genral solution of $\sec^2 2x = 1 - \tan 2x$

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

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Five Marks Questions With Answer

1. Derive $\sin(A + B)$

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2. Derive $\tan(A + B)$

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3. Derive $\tan(A+B)$

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4. Derive $\sin(A-B)$

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5. Derive $\cos(A-B)$

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6. Derive $\tan(A - B)$

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7. Derive $\sin(A + B)$

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8. Derive $\cos(A + B)$

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9. Derive $\tan(A + B)$

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10. Derive $\sin(A - B)$

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11. Derive $\cos(A - B)$

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12. Derive $\tan(A - B)$

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13. Derive $\sin(A + B)$

Watch Video Solution

14. Derive $\cos(A + B)$

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15. Derive $\tan(A + B)$

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16. Derive $\sin(A - B)$

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17. Derive $\cos(A - B)$

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18. Derive $\tan(A - B)$

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Alternate Methods

1. prove that

$\cos(A+B) = \cos A \cos B - \sin A \sin B$

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2. $\cos(A-B) = \cos A \cos B + \sin A \sin B$

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3. $\sin(A+B) = \sin A \cos B + \cos A \sin B$

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4. $\sin(A - B) = \sin A \cos B - \cos A \sin B$

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5. $\cos(A + B) = \cos A \cos B - \sin A \sin B$

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6. $\cos(A - B) = \cos A \cos B + \sin A \sin B$

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7. $\sin(A+B) = \sin A \cos B + \cos A \sin B$

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8. $\sin(A-B) = \sin A \cos B - \cos A \sin B$

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9. prove that

$\cos(A+B) = \cos A \cos B - \sin A \sin B$

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10. $\cos(A - B) = \cos A \cos B + \sin A \sin B$

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11. $\sin(A + B) = \sin A \cos B + \cos A \sin B$

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12. $\sin(A - B) = \sin A \cos B - \cos A \sin B$

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