MATHS

BOOKS - TELUGU ACADEMY MATHS (TELUGU ENGLISH)

TRIGONOMETRIC RATIONS, TRANSFORMATIONS

Spq

1. Show that $\cos^2\frac{\pi}{10}+\cos^2\frac{4\pi}{10}+\cos^2\frac{6\pi}{10}+\cos^2\frac{9\pi}{10}=2.$

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2. If $\tan 20^\circ = p$ then prove that = $\frac{\tan 610^\circ+\tan 700^\circ}{\tan 560^\circ-\tan 470^\circ}=\frac{1-p^2}{1+p^2}$

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3. If $\sec\theta + \tan\theta = 5$, then find $\sin\theta$ and determine the quadrant in which θ lies.

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4. If $\cos ec\theta + \cot\theta = 1/3$, then find $\cos\theta$ and determine the quadrant in which θ lies.

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5. If $3\sin A + 5\cos A = 5$, then show that $5\sin A - 3\cos A = \pm 3$.

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6. Find the value of $\sin 330^\circ . \cos 120^\circ + \cos 210^\circ . \sin 300^\circ$.

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7. Simplify $\cos 100^\circ \cos 40^\circ + \sin 100^\circ \sin 40^\circ$

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8. Show that

$$\sin 750^\circ \cos 480^\circ + \cos 120^\circ \cos 60^\circ = -\frac{1}{2}$$

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9. Find the value of $\tan 10^\circ + \tan 35^\circ + \tan 10^\circ . \tan 35^\circ$

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10. Find the value of $\tan 56^\circ - \tan 11^\circ - \tan 56^\circ . \tan 11^\circ$

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11. Prove that $\tan 70 - \tan 20^\circ = 2\tan 50^\circ$

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12. Prove that $\tan 72^\circ = \tan 18^\circ + 2\tan 54^\circ$

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13. Show that $\cos 35^\circ + \cos 85^\circ + \cos 155^\circ = 0$

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14. Find the value of $\sin 34^\circ + \cos 64^\circ - \cos 4^\circ$

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15. Prove that $\sin^2 52\frac{1}{2} - \sin^2 22\frac{1}{2}$.

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16. Find the value of $\cos^2 112\frac{1}{2} - \sin^2 52\frac{1}{2}$.

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17. Find the period of $f(x) = \cos(3x + 5) + 7$

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18. Find maximum & minimum value of $3\sin x - 4\cos x$

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19. Find the maximum and minimum value of $24\sin x + 7\cos x$

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20. Find the range of $7\cos x - 24\sin x + 5$

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21. If ABC are angle of a triangle then prove that $\cot A\cot B + \cot B\cot C + \cot C\cos tA = 1$

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22. If $A + B + C = \pi/2$ then establish that $\tan A\tan B + \tan B\tan C + \tan C\tan A = 1$

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23. If $A - B = \frac{3\pi}{4}$, that show that $(1 - \tan A)(1 + \tan B) = 2$

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24. If $A + B = 225^\circ$ than prove that $\frac{\cot A}{1+\cot A}.\frac{\cot B}{1+\cot B} = \frac{1}{2}$

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25. S.T $\tan\alpha = \frac{\sin 2\alpha}{1+\cos 2\alpha}$. Hence find the value of $\tan 15^\circ$ and $\tan 221/2^\circ$

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26. Show that $\cos A \cos\left(\frac{\pi}{3}+A\right)\cos\left(\frac{\pi}{3}-A\right) = \frac{1}{4}\cos 3A$ Hence deduce that $\cos.\frac{\pi}{9}\cos.\frac{2\pi}{9}\cos.\frac{4\pi}{9} = \frac{1}{8}$

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27. Prove that $\sqrt{3}\csc 20^\circ - \sec 20^\circ = 4$

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28. Show that $\cos^4\frac{\pi}{8}+\cos^4\frac{3\pi}{8}+\cos^4\frac{5\pi}{8}+\cos^4\frac{7\pi}{8}=\frac{3}{2}$

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29. Prove that $\left(1+\cos\frac{\pi}{10}\right)\left(1+\cos\frac{3\pi}{10}\right)\left(1+\cos\frac{7\pi}{10}\right)\left(1+\cos\frac{9\pi}{10}\right)=\frac{1}{16}$

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30. If A, B, C are angles of a triangle , prove that $\sin 2A+\sin 2B-\sin 2C=4\cos A\cos B\sin C$

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31. If A, B, C are angles of a triangle , prove that $\cos 2A+\cos 2B-\cos 2C=1-4\sin A\sin B\cos C$

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32. IF A,B,C are angles of a triangle , Prove that $\cos 2A + \cos 2B + \cos 2C = -4\cos A \cos B \cos C - 1$

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33. If A, B, C are angles in a triangle , prove that $\sin A + \sin B - \sin C = 4\sin.\frac{A}{2}\sin.\frac{B}{2}\cos.\frac{C}{2}$

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34. If A,B,C are angles in a triangle , then prove that $\cos A + \cos B + \cos C = 1 + 4\sin.\frac{A}{2}\sin.\frac{B}{2}\sin.\frac{C}{2}$

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35. If A, B, C are angles in a triangle , then prove that $\cos^2 A + \cos^2 B - \cos^2 C = 1 - 2\sin A \sin B \cos C.$

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36. If A, B , C are angles in a triangle, then prove that $\sin^2 A + \sin^2 B + \sin^2 C = 2 + 2\cos A \cos B \cos C$

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37. If $A, B, C = \pi$, then prove that $\cos^2.\frac{A}{2} + \cos^2.\frac{C}{2} - \cos^2.\frac{C}{2} = 2\left(\cos.\frac{A}{2}\cos.\frac{B}{2}\sin.\frac{C}{2}\right)$

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38. In ΔABC, prove that $\cos.\frac{A}{2} + \cos.\frac{B}{2} - \cos.\frac{C}{2} = 4\cos.\frac{\pi + A}{4}\cos.\frac{\pi + B}{4}\cos.\frac{\pi - C}{4}$

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39. In triangle ABC , prove that $\sin.\frac{A}{2}+\sin.\frac{B}{2}-\sin.\frac{C}{2}=-1+4\cos.\frac{\pi-A}{4}\cos.\frac{\pi-B}{4}\sin.\frac{\pi-C}{4}$

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40. If $A+B+C=\frac{\pi}{2}$, then show that $\sin 2A+\sin 2B+\sin 2C=4\cos A\cos B\cos C$

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41. If $A+B+C=0$, then prove that $\sin 2A+\sin 2B+\sin 2C=-4\sin A\sin B\sin C.$

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42. If $A+B+C=0$, then prove that $\sin 2A+\sin 2B+\sin 2C=-4\sin A\sin B\sin C.$

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43. If $A+B+C=2S$, then prove that

(i)

$$\sin(S-A)+\sin(S-B)+\sin C=4\cos.\frac{S-A}{2}\cos.\frac{S-B}{2}\sin.\frac{C}{2}$$

(ii)

$$\cos(S-A)+\cos(S-B)+\cos C=-1+4\cos.\frac{S-A}{2}\cos.\frac{S-B}{2}\cos.$$

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44. If A, B, C, D are angles of a cyclic quadrilateral then P.T $\sin A-\sin C=\sin D-\sin B.$

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45. Prove that $\cos.\frac{2\pi}{7}.\cos.\frac{4\pi}{7}.\cos.\frac{8\pi}{7}=\frac{1}{8}$

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46. Sketch the graph of $\sin 2x$ in the intervals $(0, \pi)$

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47. Sketch the graph of $\cos^2 x$ in the intervals $[0, \pi]$

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Vsaq

1. Show that

$$\cot.\ \frac{\pi}{20}.\cot.\ \frac{3\pi}{20}.\cot.\ \frac{5\pi}{20}.\cot.\ \frac{7\pi}{20}.\cot.\ \frac{9\pi}{20} = 1$$

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2. S.T$\cot.\ \frac{\pi}{16}.\cot.\ \frac{2\pi}{16}.\cot.\ \frac{3\pi}{16}.... .\cot.\ \frac{7\pi}{16} = 1$

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3. Find the value of $\sin^2\frac{\pi}{10}+\sin^2\frac{4\pi}{10}+\sin^2\frac{6\pi}{10}+\sin^2\frac{9\pi}{10}$.

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4. If $\tan 20^\circ=\lambda$ then show that $\frac{\tan 160^\circ-\tan 110^\circ}{1+\tan 160^\circ.\tan 110^\circ}=\frac{1-\lambda^2}{2\lambda}$.

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5. IF $\sin\theta=-\frac{1}{3}$ and θ does not lie in the 3^{rd} quadrant, find the value of $\cos\theta$ and $\cot\theta$

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6. IF $\sin\theta=\frac{4}{5}$ and θ is not in the first quadrant, find the value of $\cos\theta$.

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7. If $\sec\theta + \tan\theta = 2/3$, then find the value of $\sin\theta$ and determine the quadrant in which θ lies.

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8. If $a\cos\theta - b\sin\theta = c$, then show that $a\sin e\theta + b\cos = \pm\sqrt{a^2 + b^2 - c^2}$

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9. If $3\sin A + 4\cos A = 5$, then find the value of $4\sin\theta - 3\cos\theta$.

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10. If $\cos\theta + \sin\theta = \sqrt{2}\cos\theta$ then S.T $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$

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11. Show that $\sin 1140^\circ \cos 390^\circ - \cos 780^\circ \sin 750^\circ = 1/2.$

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12. Show that $\cos 340^\circ \cos 40^\circ + \sin 200^\circ \sin 140^\circ = \frac{1}{2}.$

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13. Find the value of $\tan 100^\circ + \tan 125^\circ + \tan 100^\circ . \tan 125^\circ .$

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14. Prove that $\tan 50^\circ - \tan 40^\circ - 2\tan 10^\circ .$

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15. Prove that $\frac{\cos 9^\circ + \sin 9^\circ}{\cos 9^\circ - \sin 9^\circ} = \cot 36^\circ .$

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16. Show that $\cos 42^\circ + \cos 78^\circ + \cos 162^\circ = 0$

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17. Prove that $\sin 50^\circ - \sin 70^\circ + \sin 10^\circ = 0.$

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18. Prove that $\cos 48^\circ . \cos 12^\circ = \frac{3+\sqrt{5}}{8}.$

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19. Find the value of $\sin^2 82\frac{1}{2} - \sin^2 22\frac{1}{2}.$

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20. Prove that $\sin^2 42^\circ - \cos^2 78^\circ$.

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21. Find the value of $\cos^2 52\frac{1^\circ}{2} - \sin^2 22\frac{1^\circ}{2}$

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22. Find the period of $f(x) = \sin(5x + 3)\,\forall x \in R$.

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23. Find the period of $f(x) = \cos\left(\frac{4x + 9}{5}\right)$

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24. Find the period of $\tan\left(x + 4x + 9x + \ldots\ldots + n^2 x\right)$ (n any positive integer)

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25. Find the period of $\tan 5x$.

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26. Find the period of $f(x) = 2\sin.\ \frac{\pi x}{4} + 3\cos.\ \frac{2\pi}{3}$

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27. Find the period of $\cos^4 x$.

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28. Find a cosine function whose period is 7.

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29. Find a sine function whose period is $2/3$.

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30. Find the minimum and maximum values of $3\cos x + 4\sin x$

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31. Find the maximum and minimum value of $f(x) = 5\sin x + 12\cos x - 13$.

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32. Find the range of $13\cos x + 3\sqrt{3}\sin x - 4$

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33. Find the extreme values of $\cos 2x + \cos^2 x$

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34. Find the extreme values of $3\sin^2 x + 5\cos^2 x$.

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35. In $\Delta Provet\hat{}$tan A+tan B+ tan C =tan A tan B tan C`.

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36. If $A+B+C=\pi/2$ then show that

$\cot A+\cot B+\cot C=\cot A\cot B\cot C$

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37. If $A+B=45^\circ$, then prove that

$(i)(1+\tan A)(1+\tan B)=2(ii)(\cot A-1)(\cot B-1)=2$

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38. If A is not an integral multiple of $\frac{\pi}{2}$, prove that

(i) $\tan A+\cot A=2\cos ec2A$

(ii) cot A - tan A = 2cot 2A`

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39. Prove that $\sin^2\theta+\sin^2\left(\theta+\frac{\pi}{3}\right)+\sin^2\left(\theta-\frac{\pi}{3}\right)=\frac{3}{2}$

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40. If $\tan\alpha - \tan\beta = m$ and $\cot\alpha - \cot\beta = n$, then prove that $\cot(\alpha - \beta) = \frac{1}{m} - \frac{1}{n}$

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41. If $\frac{\sin(\alpha+\beta)}{\sin(\alpha-\beta)} = \frac{a+b}{a-b}$, then prove that a $\tan\beta = b\tan\alpha$.

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42. Prove that $\frac{1-\sec 8\alpha}{1-\sec 4\alpha} = \frac{\tan 8\alpha}{\tan 2\alpha}$

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43. If $\tan\theta. = \frac{b}{a}$ then prove that $a\cos 2\theta + b\sin 2\theta = a$

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44. Show that $\sin A = \dfrac{\sin 3A}{1 + 2\cos 2A}$. Hence find the value of $\sin 15^\circ$.

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45. Show that $\sin A \sin\left(\dfrac{\pi}{3} + A\right)\sin\left(\dfrac{\pi}{3} - A\right) = \dfrac{1}{4}\sin 3A$

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46. Prove that $\cos^2.\dfrac{\pi}{8} + \cos^2.\dfrac{3\pi}{8} + \cos^2.\dfrac{5\pi}{8} + \cos^2.\dfrac{7\pi}{8} = 2$

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47. Show that $\dfrac{1}{\sin 10^\circ} - \dfrac{\sqrt{3}}{\cos 10^\circ} = 4$

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48. Prove that $\frac{1}{\cos 290^\circ} + \frac{1}{\sqrt{3}\sin 250^\circ} = \frac{4}{\sqrt{3}}$

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49. Prove that $\tan 9^\circ - \tan 27^\circ - \cot 27^\circ + \cot 9^\circ = 4$

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50. Show that $\sin^4.\frac{\pi}{8} + \sin^4.\frac{3\pi}{8}\sin^4.\frac{5\pi}{8} + \sin^4.\frac{7\pi}{8} = \frac{3}{2}$

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51. Show that $\left(1+\cos.\frac{\pi}{8}\right)\left(1+\cos.\frac{3\pi}{8}\right)\left(1+\cos.\frac{5\pi}{8}\right)\left(1+\cos.\frac{7\pi}{8}\right) = \frac{1}{8}$

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Laq

1. If $A+B+C=180^\circ$, then show that $\sin 2A+\sin 2B+\sin 2C=4\sin A\sin B\sin C.$

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2. If A, B, C are angles of a triangle, then S. T $\sin 2A-\sin 2B+\sin 2C=4\cos A\sin B\cos C$

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3. If A, B, C are angles of a triangle , prove that $\cos 2A-\cos 2B+\cos 2C=1-4\sin A\cos B\sin C$

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4. If A, B, C are angles in a triangle , then prove that $\sin A + \sin B + \sin C = 4\cos.\frac{A}{2}\cos.\frac{B}{2}\cos.\frac{C}{2}$

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5. IF A,B,C are angles in the triangle, then prove that $\cos A + \cos B - \cos C = -1 + 4\cos\frac{A}{2}.\cos\frac{B}{2}.\sin\frac{C}{2}$

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6. If A, B, C are angles in a triangle, then the $\sin^2 A + \sin^2 B - \sin^2 C = 2\sin A \sin B \cos C$

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7. If $A + B + C = \pi$, then prove that $\cos^2\left(\frac{A}{2}\right) + \cos^2\left(\frac{B}{2}\right) + \cos^2\left(\frac{C}{2}\right) = 2\left(1 + \sin.\frac{A}{2}\sin.\frac{B}{2}\sin.\frac{C}{2}\right)$

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8. If A, B, C are angles of a triangle, then $P.T \sin^2.\frac{A}{2} + \sin^2.\frac{B}{2} - \sin^2.\frac{C}{2} = 1 - 2\cos.\frac{A}{2}\cos.\frac{B}{2}\sin.\frac{C}{2}$

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9. In triangle ABC, prove that $\cos.\frac{A}{2} + \cos.\frac{B}{2} + \cos.\frac{C}{2} = 4\cos.\frac{\pi - A}{4}\cos.\frac{\pi - B}{4}\cos.\frac{\pi - C}{4}$

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10. If A, B, C are the angles in a triangle then prove that $\sin.\frac{A}{2} + \sin.\frac{B}{2} + \sin.\frac{C}{2} = 1 + 4\sin\left(\frac{\pi - A}{4}\right)\sin\left(\frac{\pi - B}{4}\right)\sin\left(\frac{\pi - C}{4}\right.$

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11. If $A+B+C=\frac{\pi}{2}$, then prove that $\cos 2A+\cos 2B+\cos 2C=1+4\sin A\sin B\sin C$.

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12. If $A+B+C=\frac{\pi}{2}$, then prove that $\sin^2 A+\sin^2 B+\sin^2 C=1-2A\sin B\sin C$.

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13. If $A+B+C=\frac{3\pi}{2}$, prove that $\cos 2A+\cos 2B+\cos 2C=1-4\sin A\sin B\sin C$.

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14. If $A+B+C=\frac{3\pi}{2}$, prove that $\cos^2 A+\cos^2 B-\cos^2 C=-2\cos A\cos B\sin C$.

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15. If $A+B+C=0$, then prove that

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

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16. If A+B+C = 2S , then

P.T

$\cos(S-A)+\cos(S-B)+\cos(S-C)+\cos S=4\cos.\frac{A}{2}\cos.\frac{B}{2}\cos.\frac{C}{2}$

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17. If $A+B+C+D=360^\circ$, the prove that

$\cos 2A+\cos 2B+\cos 2C+\cos 2D=4\cos(A+B)\cos(A+C)\cos(A+D$

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18. Find the value of $2\left(\sin^6\theta+\cos^6\theta\right)-3\left(\sin^4\theta+\cos^4\theta\right)$

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19. Prove that $(1+\cot\theta-\operatorname{cosec}\theta)(1+\tan\theta+\sec\theta)=2.$

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20. If $\frac{2\sin\theta}{1+\cos\theta+\sin\theta}=x,$ find the value of $\frac{1-\cos\theta+\sin\theta}{1+\sin\theta}$

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21. Show that $\cos^4\alpha+2\cos^2\alpha\left(1-\frac{1}{\sec^2\alpha}\right)=\left(1-\sin^4\alpha\right)$

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22. For what values of x in the first quadrant $\frac{2\tan x}{1-\tan^2 x}$ is positive ?

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23. If A,B,C,D are the angles of a cyclic quadrilateral then $\cos A + \cos B + \cos C + \cos D =$

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24. Express $\cos^6 A + \sin^6 A$ interms of $\sin 2A$.

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25. Prove that $\sin^2\left(\frac{\pi}{8} + \frac{A}{2}\right) - \sin^2\left(\frac{\pi}{8} - \frac{A}{2}\right) = \frac{1}{\sqrt{2}}\sin A$.

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26. Expres $\sqrt{3}\sin 0 + \cos 0$ as a sine of an angle .

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

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28. Find the value of $\tan 75^\circ + \cot 75^\circ$

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29. If $\tan\theta = \frac{\cos 11^\circ + \sin 11^\circ}{\cos 11^\circ - \sin 11^\circ}$ and θ is the third quadrant find θ.

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30. If $\sin A = \frac{12}{13}, \cos B = \frac{3}{5}$ and neither A nor B is in the first quadrant, then find the quadrant in which A+B lies.

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31. If $0 < A, B < 90^\circ, \cos A = \frac{5}{13}$ and $\sin B = \frac{4}{5}$ then find $\sin(A + B)$.

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32. If $\sin = \frac{1}{\sqrt{10}}, \sin\beta = \frac{1}{\sqrt{5}}$ and α, β are acute, show that $\alpha + \beta = \pi/4$

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33. If $\cos\theta = \frac{-5}{13}$ and $\frac{\pi}{2} < \theta < \pi$, find the value of $\sin 2\theta$

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34. If $\cos\theta = t(0 < t < 1)$ and θ does not lies in the first quadrent , find $\sin\theta$ and $\tan\theta$.

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35. If $0 < A < \pi/4$ and $\cos A = 4/5$, then find the values of $\sin 2A$ and $\cos 2A$

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36. If $\cos\theta = \frac{5}{13}$ and $270^\circ < \theta < 360^\circ$, evaluate $\sin(\theta/2)$ and $\cos(\theta/2)$

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37. If $\sin\alpha = \frac{3}{5}$, where $\frac{\pi}{2} < \alpha < \pi$, evaluate $\cos 3\alpha$ and $\tan 2\alpha$.

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38. If $\cos 0 = \frac{-3}{5}$ and $\pi < 0 < \frac{3\pi}{2}$, find the value of $\tan\theta/2$

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39. Prove that $\frac{\sin\theta + \sin 2\theta}{1 + \cos 0 + \cos 2\theta} = \tan\theta$

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40. If θ is not an integral multiple of $\frac{\pi}{2}$, prove that $\tan\theta + 2\tan 2\theta + 4\tan 4\theta + 8\cot 8\theta = \cot\theta$

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41. Prove that $\tan 3A.\ \tan 2A.\ \tan A = \tan 3A - \tan 2A - \tan A$

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42. If $\cos\theta > 0, \tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n$, then show that $m^2 - n^2 = 4\sqrt{mn}$

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43. If $0 < A < B < \frac{\pi}{4}$ and $\sin(A+B) = \frac{24}{25}$ and $\cos(A-B) = \frac{4}{5}$, then find the value of $\tan 2A$.

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44. If $A+B, A$ are acute angles such that $\sin(A+B) = \frac{24}{25}$ and $\tan A = \frac{3}{4}$, then find the value of $\cos B$.

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45. If $\tan(\alpha - \beta) = \frac{7}{24}$ and $\tan\alpha = \frac{4}{3}$, where α and β are in the first quadrant prove that $\alpha + \beta = \pi/2$

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46. In a ΔABC, A is obtuse. If $\sin A = \frac{3}{5}$ and $\sin B = \frac{5}{13}$, then show that $\sin C = \frac{16}{65}$

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47. In a ΔABC, If $\tan.\frac{A}{2}=\frac{5}{6}$ and $\tan.\frac{B}{2}=\frac{20}{37}$, then show that $\tan\left(\frac{C}{2}\right)=\frac{2}{5}$

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48. If $\cos\alpha=\frac{3}{5}$ and $\cos\beta=\frac{5}{13}$ and α,β are acute angles, then prove that

(a)$\sin^2\left(\frac{\alpha-\beta}{2}\right)=\frac{1}{65}$ and

(b) $\cos^2\left(\frac{\alpha+\beta}{2}\right)=\frac{16}{65}$

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49. For any $\alpha\in R$, prove that $\cos^2\left(\alpha-\frac{\pi}{4}\right)+\cos^2\left(\alpha+\frac{\pi}{12}\right)-\cos^2\left(\alpha-\frac{\pi}{12}\right)=\frac{1}{2}$

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50. For $\alpha, \beta \in R$, prove that $(\cos\alpha + \cos\beta)^2 + (\sin\alpha + \sin\beta)^2 = 4\cos^2.\frac{(\alpha-\beta)}{2}$

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51. If none of A,B, A+B is an integral multiple of π, then prove that $\frac{1-\cos A+\cos B-\cos(A+B)}{1+\cos A-\cos B-\cos(A+B)} = \tan.\frac{A}{2}\cot.\frac{B}{2}$

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52. Prove that $\cos.\frac{\pi}{11}.\cos.\frac{2\pi}{11}.\cos.\frac{3\pi}{11}\cos.\frac{4\pi}{11}.\cos.\frac{5\pi}{11} = \frac{1}{32}$

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53. If A is not an integral multiple of (π), prove that $\cos A\cos 2A\cos 4A\cos 8A = \frac{\sin 16A}{16\sin A}$ Hence deduce that $\cos.\frac{2\pi}{15}.\cos.\frac{4\pi}{15}.\cos.\frac{8\pi}{18}.\cos.\frac{16\pi}{15} = \frac{1}{16}$

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54. In a triangle ABC, If $\cot A + \cot B + \cot C = \sqrt{3},$ then show that the triangle is equilateral.

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55. If none of the denominators is zero, prove that .

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56. If $\cos x + \cos y = \frac{4}{5}$ and $\cos x - \cos y = \frac{2}{7},$ then the value of $14\tan\left(\frac{x-y}{2}\right) + 5\cot\left(\frac{x+y}{2}\right)$

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57. Prove that $\tan A.(\tan 60^\circ + A).\tan(60^\circ - A) = \tan 3A$ and hence find the value of $\tan 6^\circ \tan 42^\circ \tan 66^\circ \tan 78^\circ$.

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58. Prove that $\cos 12^\circ + \cos 84^\circ + \cos 132^\circ + \cos 156^\circ = -1/2$

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59. Prove that $\cos^2 76^\circ + \cos^2 16^\circ - \cos 76^\circ \cos 16^\circ = \frac{3}{4}$

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60. If $\sin(y+z-x), \sin(z+x-y), \sin(x+y-z)$ are in A. P , then prove that $x, \tan y, \tan z$ are also in A.P.

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61. If $\sin\alpha + \operatorname{cosec}\alpha = 2$, find value of $\sin^n\alpha + \operatorname{cosec}^n\alpha, n \in Z$.

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62. Sketch the graph of tanx between 0 and $\pi/4$

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63. Sketch the graph of $\sin x$ in the intervals $|-\pi, \pi]$

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64. Sketch the graph of $\cos 2x$ in the intervals $|0, \pi]$

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