MATHS

BOOKS - HIMALAYA MATHS (KANNADA ENGLISH)

MEASUREMENT OF ANGLES, TRIGONOMETRIC RATIOS AND RELATION BETWEEN SIDES AND ANGLES OF A TRIANGLE

Question Bank

1. A circular wire of radius $7cm$ is cut and bent again into an arc of a circle of radius $12cm$. The angle subtended by the arc at the centre is

A. 50°

B. 210°

C. 100°

D. 60°

Answer:

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2. At $2.15O'$ clock, the hour hand and the minute hand of a clock form an angle

A. 5°

B. $22\frac{1^\circ}{2}$

C. 28°

D. 30°

Answer:

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3. If $a\cos\theta + b\sin\theta = p$ and $a\sin\theta - b\cos\theta = q$ then

A. $a^2 - b^2 = p^2 - q^2$

B. $a^2 + b^2 = p^2 + q^2$

C. $a + b = p + q$

D. $a - b = p - q$

Answer:

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4. If $\sin 2\theta + \sin 2\phi = \frac{1}{2}$ and $\cos 2\theta + \cos 2\phi = \frac{3}{2}$ then $\cos^2(\theta - \phi) =$

A. $\frac{3}{8}$

B. $\frac{5}{4}$

C. $\frac{3}{4}$

D. $\frac{5}{8}$

Answer:

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5. $x = \sec\theta - \tan\theta, y = \cos ec\theta + \cot\theta,$ then

A. $xy + 1 = x - y$

B. $xy + 1 = y - x$

C. $xy + 1 = x + y$

D. $xy + 1 = x$

Answer:

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

A. $\sqrt{2}\sin\theta$

B. $2\sin\theta$

C. $-\sqrt{2}\sin\theta$

D. $-2\sin\theta$

Answer:

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7. If $\sin\theta + \cos ec\theta = 2$ then $\sin^2\theta + \cos ec^2\theta =$

A. 1

B. 2

C. 4

D. -1

Answer:

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8. If $\cos ecA + \cot A = \frac{11}{2}$, then $\tan A$ is

A. $\frac{21}{22}$

B. $\frac{15}{16}$

C. $\frac{44}{117}$

D. $\frac{117}{43}$

Answer:

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9. If $\cos ec\theta - \cot\theta = \frac{1}{2}, 0 < \theta < \frac{\pi}{2}$ then $\cos\theta =$

A. $\frac{5}{3}$

B. $\frac{3}{5}$

C. $-\frac{3}{5}$

D. $-\frac{5}{3}$

Answer:

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10. If $\sin x + \sin y = 3(\cos y - \cos x)$ then the value of $\sin 3x + \sin 3y =$

A. 1

B. -1

C. 0

D. 2

Answer:

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11. If $\sec\theta + \tan\theta = 1.5$ then $\tan\theta =$

A. $\frac{13}{12}$

B. $\frac{5}{12}$

C. $\frac{5}{13}$

D. $\frac{12}{13}$

Answer:

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12. If $\tan\theta = \frac{p}{q}$ then $\frac{p\sin\theta - q\cos\theta}{p\sin\theta + q\cos\theta} =$

A. $\frac{p^2+q^2}{p^2-q^2}$

B. $\frac{p^2-q^2}{p^2+q^2}$

C. $\left(p^2+q^2\right)\left(p^2-q^2\right)$

D. $\frac{p^2+q^2}{p^2}$

Answer:

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

A. b

B. a

C. ab

D. $\frac{a}{b}$

Answer:

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14. If $a\cos\theta - b\sin\theta = c$ then $a\sin\theta + b\cos\theta =$

A. $\pm\sqrt{a^2 + b^2 - c^2}$

B. $\pm\sqrt{b^2+c^2-a^2}$

C. $\pm\sqrt{c^2+a^2-b^2}$

D. $\pm\sqrt{a^2+b^2+c^2}$

Answer:

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15. $\sin\alpha=\frac{12}{13}\left(0<\alpha<\frac{\pi}{2}r\right)\quad\cos\beta=-\frac{3}{5}\left(\pi<\beta<\frac{3\pi}{2}\right)$

then $\sin(\alpha+\beta)$ is

A. $-\frac{56}{65}$

B. $\frac{16}{65}$

C. $\frac{56}{65}$

D. $-\frac{16}{65}$

Answer:

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16. If $A + B = 225^\circ$ then $\frac{\cot A}{1 + \cot A} \cdot \frac{\cot B}{1 + \cot B} =$

A. 1

B. $\frac{1}{2}$

C. 2

D. 0

Answer:

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17. If $\sin\theta + \sin^2\theta + \sin^3\theta = 1$ then $\cos^6\theta - 4\cos^4\theta + 8\cos^2\theta =$

A. 3

B. 2

C. 4

D. 1

Answer:

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18. $\frac{\cos 9^\circ + \sin 9^0}{\cos 9^\circ - \sin 9^\circ} =$

A. $\tan 26^\circ$

B. $\tan 81^\circ$

C. $\tan 54^\circ$

D. $\tan 18^\circ$

Answer:

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19. If $\sin\theta + \sin^2\theta = 1$ then $\cos^{12}\theta + 3\cos^{10}\theta + 3\cos^8\theta + \cos^6\theta =$

A. 3

B. 4

C. 2

D. 1

Answer:

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20. If $\cos(\alpha+\beta)=\frac{4}{5}, \sin(\alpha-\beta)=\frac{5}{13}$ and $0<\alpha, \beta<\frac{\pi}{4}$, then $\tan 2\alpha=$

A. $\frac{56}{33}$

B. $\frac{33}{56}$

C. $\frac{33}{48}$

D. $\frac{48}{33}$

Answer:

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21. If $\tan\alpha=\frac{1}{3}$ and $\tan(\beta)=\frac{1}{2}$ then $\tan(\alpha+\beta)=$

A. 1

B. -1

C. 2

D. 3

Answer:

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22. $\cos(\alpha+\beta)=\frac{3}{5}$ and $\sin(\alpha-\beta)=\frac{3}{5}$ and $0<\alpha,\beta<\frac{\pi}{2}$ then $\sin 2\alpha=$

A. 0

B. $\frac{16}{15}$

C. $\frac{56}{65}$

D. $\frac{64}{65}$

Answer:

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23. If $\cos(\alpha+\beta)=\frac{4}{5}, \sin(\alpha-\beta)=\frac{5}{13}$ and $0<\alpha, \beta<\frac{\pi}{2}$ then $\cos 2\alpha =$

A. $\frac{25}{16}$

B. $\frac{33}{65}$

C. $\frac{19}{12}$

D. $\frac{20}{7}$

Answer:

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24. If ABC are the angles of a triangle then $\sin^2 A + \sin^2 B + \sin^2 C - 2\cos A \cos B \cos C$

A. 1

B. 2

C. 3

D. 4

Answer:

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25. If the angle A of a triangle ABC is given by equation $5\cos A + 3 = 0,$ then $\sin A$ and $\tan A$ are the roots of the equation

A. $15x^2 - 8x - 16 = 0$

B. $15x^2 - 8\sqrt{2}x + 16 = 0$

C. $15x^2 - 8x + 16 = 0$

D. $15x^2 + 8x - 16 = 0$

Answer:

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26. If $3\sin 2\theta = 2\sin 3\theta$ and $0 < \theta < \pi$ then $\sin\theta =$

A. $\frac{\sqrt{2}}{3}$

B. $\frac{\sqrt{3}}{\sqrt{5}}$

C. $\frac{\sqrt{15}}{4}$

D. $\frac{\sqrt{2}}{\sqrt{5}}$

Answer:

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27. If $P_n = \cos^n \theta + \sin^n \theta$ then $2.\ P_6 - 3.\ P_4 + 1 =$

A. 2

B. 3

C. 0

D. 1

Answer:

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28. If $A - B = \frac{\pi}{4}$ then $(1 + \tan A)(1 - \tan B) =$

A. 2

B. 1

C. 0

D. 3

Answer:

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29. $\cot\theta = \sin 2\theta(\theta \neq qn\pi, n \in z),$ if $\theta =$

A. 45° and 60°

B. 45° and 90°

C. 45° only

D. 90° only

Answer:

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30. The least value of $3\sin x - 4\cos x + 7$ is

A. 0

B. 2

C. 3

D. 6

Answer:

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31. If $\sin A = \frac{3}{5}, \tan B = \frac{1}{2}$ and $\frac{\pi}{2} < A < \pi$ and $\pi < B < 3\frac{\pi}{2}$, then $8\tan A + \sqrt{5}\sec B =$

A. $\frac{+7}{2}$

B. $\frac{15}{2}$

C. $-\frac{15}{2}$

D. $-\frac{17}{2}$

Answer:

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32. If $\sin 2\theta = \cos 3\theta$ and θ is an acute angle then $\sin\theta =$

A. $\frac{\sqrt{5}-1}{4}$

B. $-\left(\frac{\sqrt{5}-1}{4}\right)$

C. $\frac{\sqrt{5}+1}{4}$

D. $-\frac{\sqrt{5}-1}{4}$

Answer:

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33. The value of $\frac{\sin^2 3A}{\sin^2 A} - \frac{\cos^2 3A}{\cos^2 A}$ is equal to

A. $\cos 2A$

B. $8\cos 2A$

C. $\frac{1}{8}\cos 2A$

D. $\frac{1}{2}\cos 2A$

Answer:

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34. If $\cos 2B = \dfrac{\cos(A+C)}{\cos(A-C)}$, then $\tan A, \tan B, \tan C$ are in

A. A.P

B. G.P

C. H.P

D. none of these

Answer:

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35. If $\cos\theta = \dfrac{2\cos\phi - 1}{2 - \cos\phi}$, then $\dfrac{\tan(\theta)}{2} =$

A. $\sqrt{3}\dfrac{\tan(\phi)}{2}$

B. $\dfrac{\tan(\phi)}{2}$

C. $\frac{1}{\sqrt{3}} \frac{\tan(\phi)}{2}$

D. $3\frac{\tan(\phi)}{2}$

Answer:

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36. $\frac{3\cos\phi + \cos 3\phi}{3\sin\phi - \sin 3\phi} =$

A. $1 + \cot^2\phi$

B. $\cot^4\phi$

C. $\cot^3\phi$

D. $2\cot\phi$

Answer:

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37. If $\sin 2x = n \sin 2y$ then the value of $\frac{\tan(x+y)}{\tan(x-y)} =$

A. $\frac{n+1}{n-1}$

B. $\frac{n-1}{n+1}$

C. $\frac{1-n}{n+1}$

D. $\frac{1+n}{1-n}$

Answer:

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38. If $\tan x = \frac{b}{a}$ then $\sqrt{\frac{a+b}{a-b}} + \sqrt{\frac{a-b}{a+b}} =$

A. $\frac{2\sin x}{\sqrt{\sin 2x}}$

B. $\frac{2\cos x}{\sqrt{\cos 2x}}$

C. $\frac{2\cos x}{\sqrt{\sin 2x}}$

D. $\frac{2\sin x}{\sqrt{\cos 2x}}$

Answer:

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39. If $\tan(\pi\cos\theta) = \cot(\pi\sin\theta)$, then $\cos\left(\theta - \frac{\pi}{4}\right)$ is :

A. $\sqrt{2}$

B. $\frac{1}{\sqrt{2}}$

C. $-\frac{1}{2\sqrt{2}}$

D. $\frac{1}{2\sqrt{2}}$

Answer:

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40. If $\tan(\pi\cos\theta) = \cot(\pi\sin\theta), 0 < \theta < \frac{3\pi}{4}$ then, $\sin\left(\theta + \frac{\pi}{4}\right)$ equals

A. $\frac{1}{\sqrt{2}}$

B. $\frac{1}{2}$

C. $\frac{1}{2\sqrt{2}}$

D. $\sqrt{2}$

Answer:

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41. If $0 < x < \frac{\pi}{4}$ then $\sec 2x - \tan 2x =$

A. $\tan^2\left(x + \frac{\pi}{4}\right)$

B. $\tan\left(x+\frac{\pi}{4}\right)$

C. $\tan\left(\frac{\pi}{4}-x\right)$

D. $\tan\left(x-\frac{\pi}{4}\right)$

Answer:

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42. If $\tan A+\cot A=4$ then $\tan^4 A+\cot^4 A=$

A. 110

B. 191

C. 80

D. 194

Answer:

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43. The value of $4\sin A\cos^3 A - 4\cos A\sin^3 A$

A. $\cos 2A$

B. $\sin 3A$

C. $\sin 2A$

D. $\sin 4A$

Answer:

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44. Maximum value of $6\sin x\cos x + 4\cos 2x$

A. 6

B. 4

C. 5

D. 10

Answer:

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45. $\sin^6\theta + \cos^6\theta + 3\sin^2\theta.\cos^2\theta =$

A. 0

B. 1

C. 2

D. 3

Answer:

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46. If $1 + \sin x + \sin^2 x + \ldots\ldots$ to $\infty = 4 + 2$root 3 , $0 < x < \pi$ then $x =$

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{3\pi}{4}$

D. $\frac{\pi}{3}$ or

Answer:

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47. If for real values of x, $\cos\theta = x + \frac{1}{x}$, then

A. θ is an acute angle

B. θ is a right angle

C. θ is an obtuse angle

D. no value of θ is possible

Answer:

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48. If $\sin\theta_1 + \sin\theta_2 + \sin\theta_3 = 3$ then $\cos\theta_1 + \cos\theta_2 + \cos\theta_3 =$

A. 0

B. 1

C. 2

D. 3

Answer:

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49. If sec $x = P$ and cosec $x = Q$ then

A. $P^2 + Q^2 = PQ$

B. $P^2 + Q^2 = P^2Q^2$

C. $P^2 - Q^2 = P^2Q^2$

D. $P^2 + Q^2 = -P^2Q^2$

Answer:

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50. If $\tan\theta + \sec\theta = \sqrt{3}, 0 < \theta < \pi$ then $\theta =$

A. $\frac{5\pi}{6}$

B. $\frac{2\pi}{3}$

C. $\frac{\pi}{6}$

D. $\frac{\pi}{3}$

Answer:

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51. $\log \tan 1^\circ + \log \tan 2^\circ + ... + \log \tan 89^\circ =$

A. 1

B. 0

C. $\frac{\pi}{4}$

D. $\frac{1}{2}$

Answer:

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52. The value of $e^{\log_{10} \tan 1^o + \ldots . + \log_{10} \tan 89^o}$ is

A. 0

B. e

C. $\frac{1}{e}$

D. 1

Answer:

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53. $\cos^2 5^\circ + \cos^2 10^\circ + \cos^2 15^\circ + \ldots . + \cos^2 90^\circ =$

A. $7\frac{1}{2}$

B. $8\frac{1}{2}$

C. $9\frac{1}{2}$

D. 9

Answer: B

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54. The value of $\cot 5^\circ . \cot 10^\circ \ldots \cot 85^\circ$ is

A. 1

B. $\frac{1}{\sqrt{2}}$

C. $\frac{1}{2}$

D. $\underline{0}$

Answer: A

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55. $\cot 7\frac{1}{(2)^{\circ}} =$

A. $\sqrt{2}+\sqrt{3}+\sqrt{4}+\sqrt{6}$

B. $\sqrt{2}-\sqrt{3}+\sqrt{4}+\sqrt{6}$

C. $\sqrt{2}+\sqrt{3}-\sqrt{4}+\sqrt{6}$

D. $\sqrt{2}+\sqrt{3}+\sqrt{4}-\sqrt{6}$

Answer: C

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56. If $x.\tan 45^{\circ}.\cos 60^{\circ} = \sin 60^{\circ}\cot 60^{\circ}$, then x

A. 1

B. $\frac{1}{2}$

C. $\sqrt{3}$

D. $\frac{1}{\sqrt{2}}$

Answer:

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57. $\frac{\sin 70^\circ + \cos 40^\circ}{\cos 70^\circ + \sin 40^\circ} =$

A. $\frac{1}{\sqrt{3}}$

B. $\sqrt{3}$

C. $\frac{1}{2}$

D. 1

Answer:

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58. $\sin 47^\circ + \sin 61^\circ - \sin 11^\circ - \sin 25^\circ =$

A. $\sin 36^\circ$

B. $\cos 36^\circ$

C. $\sin 7^\circ$

D. $\cos 7^\circ$

Answer:

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59. $\sqrt{3}\cot 20^\circ - 4\cos 20^\circ =$

A. 1

B. -1

C. 0

D. $\frac{1}{2}$

Answer:

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60. For $A = 133^\circ$, $2\cos\left(\frac{A}{2}\right) =$

A. $\sqrt{1+\sin A} + \sqrt{1-\sin A}$

B. $\sqrt{1+\sin A} - \sqrt{1-\sin A}$

C. $-\sqrt{1+\sin A} + \sqrt{1-\sin A}$

D. $-\sqrt{1+\sin A} - \sqrt{1-\sin A}$

Answer:

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61. If $0^\circ < \theta < 180^\circ$ then $\sqrt{2+\sqrt{2+\sqrt{\ldots+\sqrt{2(1+\cos\theta)}}}} =$ Here there are n number of 2 's

A. $2\dfrac{\cos(\theta)}{2^{n-1}}$

B. $2\dfrac{\cos(\theta)}{2^{n}}$

C. $2\dfrac{\cos(\theta)}{2^{n+1}}$

D. $2\dfrac{\cos(\theta)}{2}$

Answer: B

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62. $\cos^2 73^\circ + \cos^2 47^\circ + \cos 73^\circ . \cos 47^\circ =$

A. 3

B. 4

C. $\frac{3}{4}$

D. $\frac{4}{3}$

Answer:

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63. $\cos 40^\circ + \cos 80^\circ + \cos 160^\circ + \cos 240^\circ =$

A. 0

B. 1

C. $\frac{1}{2}$

D. $-\frac{1}{2}$

Answer:

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64. $\frac{\cos^4(\pi)}{8} + \frac{\cos^4(3\pi)}{8} + \frac{\cos^4(5\pi)}{8} + \frac{\cos^4(7\pi)}{8} =$

A. $\frac{1}{2}$

B. 1

C. $\frac{3}{2}$

D. 2

Answer:

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65. $\frac{\sin^2(\pi)}{18} + \frac{\sin^2(\pi)}{9} + \frac{\sin^2(7\pi)}{18} + \frac{\sin^2(4\pi)}{9} =$

A. 1

B. 4

C. 2

D. 0

Answer:

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66. $\sin 12^\circ . \sin 48^\circ . \sin 54^\circ =$

A. $\frac{1}{4}$

B. $\frac{1}{8}$

C. $\frac{1}{2}$

D. $\frac{1}{6}$

Answer:

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67. The value of $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ$ is

A. $-\frac{3}{16}$

B. $\frac{5}{16}$

C. $\frac{3}{16}$

D. $-\frac{1}{16}$

Answer:

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68. The value of $\frac{\cos(\pi)}{7}.\frac{\cos(2\pi)}{7}.\frac{\cos(4\pi)}{7}$ is

A. $-\frac{1}{8}$

B. $-\frac{1}{4}$

C. $-\frac{1}{16}$

D. $-\frac{3}{16}$

Answer:

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69. $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ =$

A. $-\frac{1}{2}$

B. 1

C. $\frac{1}{2}$

D. $\frac{1}{8}$

Answer:

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70. $\frac{\cos(\pi)}{11} + \frac{\cos(3\pi)}{11} + \frac{\cos(5\pi)}{11} + \frac{\cos(7\pi)}{11} + \frac{\cos(9\pi)}{11} =$

A. 0

B. $-\frac{1}{2}$

C. $\frac{1}{2}$

D. 1

Answer:

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71. $\cos 20^\circ \cos 40^\circ \cos 60^\circ \cos 80^\circ =$

A. $\frac{1}{8}$

B. $\frac{1}{64}$

C. $\frac{1}{16}$

D. $\frac{1}{32}$

Answer:

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72. The value of $\cos \frac{\pi}{65} . \cos \frac{2\pi}{65} . \cos \frac{4\pi}{65} . \cos \frac{8\pi}{65} . \cos \frac{16\pi p}{65} . \cos \frac{32\pi}{65}$ is :

A. $\frac{1}{8}$

B. $\frac{1}{64}$

C. $\frac{1}{32}$

D. $\frac{1}{16}$

Answer:

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73. $\sin 10^\circ . \sin 30^\circ . \sin 50^\circ . \sin 70^\circ =$

A. $\frac{1}{16}$

B. $\frac{1}{32}$

C. $\frac{1}{64}$

D. $\frac{1}{52}$

Answer:

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74. The value of $\frac{\sin(\pi)}{7} + \frac{\sin(2\pi)}{7} + \frac{\sin(3\pi)}{7}$ is

A. $\frac{\cot(\pi)}{14}$

B. $\frac{1}{2}\frac{\cot(\pi)}{14}$

C. $\frac{\tan(\pi)}{14}$

D. $\frac{1}{2}\frac{\tan(\pi)}{14}$

Answer:

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75. In a triangle $ABC, \tan A + \tan B + \tan C = 6$ and $\tan A.\ \tan B = 2,$ then the values of $\tan A\ \tan B$ and $\tan C$ are

A. 1,2,3

B. 2,1,3

C. both (a) and (b)

D. none of these

Answer: B

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76. If $A + B + C = \pi$, then $\cos B + \cos C =$

A. $2\frac{\cos(A)}{2}\frac{\cos(B-C)}{2}$

B. $2\frac{\sin(A)}{2}\frac{\cos(B-C)}{2}$

C. $2\frac{\cos(C)}{2}\frac{\cos(A-B)}{2}$

D. $2\frac{\cos(B)}{2}\frac{\cos(C)}{2}$

Answer:

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77. If $A+B+C=180^\circ$ then the value of $\frac{\cot(A)}{2}+\frac{\cot(B)}{2}+\frac{\cot(C)}{2}=$

A. $\frac{\cot(A)}{2}.\frac{\cot(B)}{2}.\frac{\cot(C)}{2}$

B. $4\frac{\cot(A)}{2}.\frac{\cot(B)}{2}.\frac{\cot(C)}{2}$

C. $2\frac{\cot(A)}{2}.\frac{\cot(B)}{2}.\frac{\cot(C)}{2}$

D. $8\frac{\cot(A)}{2}.\frac{\cot(B)}{2}.\frac{\cot(C)}{2}$

Answer:

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78. If in a triangle $ABC, \tan A+\tan B+\tan C=6$ then $\cot A.\cot B.\cot C=$

A. 6

B. 1

C. $\frac{1}{6}$

D. $\frac{3}{2}$

Answer:

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79. If $A + B + C = \pi$, prove that $\sin 2A + \sin 2B + \sin 2C = 4 \sin A \sin B \sin C$.

A. $4 \sin A . \sin B . \sin C$

B. $4 \cos A . \cos B . \cos C$

C. $2 \sin A . \sin B . \sin C$

D. $8 \sin A . \sin B . \sin C$

Answer:

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80. If any triangle $ABC \sin^2 A + \sin^2 B - \sin^2 C =$

A. $2 \sin A . \sin B . \sin C$

B. $2 \cos A . \cos B . \cos C$

C. $2 \cos A . \sin B . \sin C$

D. $2 \sin A . \sin B . \cos C$

Answer:

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81. A tower subtends an angle alpha at a point on the same level as the foot of the tower and at the second point h metres above the first the angle of depression of the base of a tower is beta The height of the tower

A. $b\cot\alpha.\tan\beta$

B. $b\tan\alpha.\cot\beta$

C. $b\tan\alpha.\tan\beta$

D. $b\cot\alpha.\cot\beta$

Answer:

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82. Two poles are 25 metres and 15 metres high and the line joining their tops makes an angle of 45° with the horizontal.

Then the distance between these posts in

A. $5mts$

B. $\frac{10}{\sqrt{2}}mts$

C. $10mts$

D. $10\sqrt{2}mts$

Answer:

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83. The tops of two poles of height $20mt$ and $14mt$ are connected by a wire. If the wire makes an angle 30° with the horizontal then the length of the wire is

A. $12mts$

B. $10mts$

C. $8mts$

D. none of these

Answer:

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84. The angle of elevation of the sun, if the length of the shadow of a tower is $\sqrt{3}$ times the height of the tower is

A. 30°

B. 60°

C. 45°

D. 150°

Answer:

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85. If two towers of heights h_1 and h_2 subtend angles 60^o and 30° respectively at the mid poind of the line joining their feet then $h_1 : h_2$.

A. 1:2

B. 1:3

C. 2:1

D. 3:1

Answer:

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86. The angle of depression of the top of a tower at a point $70mts$ from the base is 45°, Then the height of the tower is

A. $70mts$

B. $70\sqrt{2}mts$

C. $\frac{70}{\sqrt{2}}mts$

D. $35mts$

Answer:

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87. The horizontal distance between two towers is $60mts$. The angular elevation of the top of the taller tower as seen from the top of the shorter one is 30°. If the height of the taller tower is 150 mts, the height of the shorter one is

A. $116mts$ nearly

B. $200mts$ nearly

C. $216mts$ nearly

D. none of these

Answer:

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88. In the triangle ABC, $\hat{A} = 30^\circ$, $\hat{C} = 105^\circ$ and $b = 3\sqrt{2}$ then $a =$

A. 2

B. 3

C. 3,2

D. 2

Answer:

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89. In the triangle ABC, $\widehat{A} = 75^\circ$, $\widehat{B} = 45^\circ$, $c = \sqrt{3}$, then $b =$

A. 2

B. 3

C. $\sqrt{6}$

D. $\sqrt{2}$

Answer:

Watch Video Solution

90. In the triangle ABC, $\widehat{A} = 120^\circ$, $b = 2$, $\widehat{C} = 30^\circ$ then $a =$

A. $2\sqrt{3}$

B. 2

C. $\frac{\sqrt{3}}{2}$

D. $\frac{1}{2}$

Answer:

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91. In a triangle ABC $b = \sqrt{3}, c = 1, A = 30^\circ$ then the largest angle of the triangle is

A. 135°

B. 90°

C. 60°

D. 120°

Answer:

Watch Video Solution

92. If the angles of a triangle are in the ratio $1:2:3$, then the sides are in the ratio :

A. 2:3:1

B. $1:\sqrt{3}:2$

C. $2:\sqrt{3}:1$

D. $1:\sqrt{3}:2$

Answer:

Watch Video Solution

93. The angles A,B and C of a triangle ABC are in A.P. If $b:c=\sqrt{3}:\sqrt{2}$, then the angle A is

A. 75°

B. 90°

C. 120°

D. 150°

Answer:

Watch Video Solution

94. In a triangle ABC, $\widehat{A}=45^\circ$, $\widehat{B}=75^\circ$, then $a+c\sqrt{2}=$

A. $2b$

B. $3b$

C. $\underline{b}$

D. $4b$

Answer:

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95. If in a triangle $ABC, a = 5, b = 4, A = \frac{\pi}{2} + B$, then the value of C is

A. $\frac{\tan^{-1}(1)}{2}$

B. $\frac{\tan^{-1}(9)}{40}$

C. cannot be evaluated

D. $\frac{\tan^{-1}(1)}{9}$

Answer:

Watch Video Solution

96. If the sides of a triangle are $x^2 + x + 1$, $x^2 - 1$ and $2x + 1$ then the largest angle is

A. 120°

B. 60°

C. 42°

D. 30°

Answer:

Watch Video Solution

97. If in a triangle ABC, $a\cos^2.\frac{C}{2} + c\cos^2.\frac{A}{2} = \frac{3b}{2}$, then the sides a, b, c :

A. are in G.P.

B. are in H.P.

C. satisfy a+b=c

D. are in A.P.

Answer:

Watch Video Solution

98. In a triangle ABC, if $\cot A, \cot B, \cot C$ are in A.P, then a^2, b^2, c^2 are in

A. AP

B. GP

C. HP

D. none of these

Answer:

Watch Video Solution

99. If the angles A, B, C of a triangle are in $A.P$ and sides a, b, c are in G.P, then a^2, b^2, c^2 are in

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100. In a triangle ABC, $\hat{A} = \frac{\pi}{2}$ then $\cos^2 B + \cos^2 C =$

A. -2

B. -1

C. 1

D. 0

Answer:

Watch Video Solution

101. In a triangle ABC, $a = 4, b = 3, \angle A = 60^\circ$, then c is the root of the equation

A. $c^2 - 3c - 7 = 0$

B. $c^2 + 3c + 7 = 0$

C. $c^2 - 3c + 7 = 0$

D. $c^2 + 3c - 7 = 0$

Answer:

Watch Video Solution

102. In a ΔABC, if $a+b=3c$, then the value of $\cot.\frac{A}{2}\cot.\frac{B}{2}$ is

A. 1

B. 2

C. 3

D. 4

Answer:

Watch Video Solution

103. If a $\cos A = b\cos B$ then prove that ΔABC is either isosceles or right angled.

A. isosceles only

B. right angled only

C. equilateral

D. right angled or isosceles

Answer:

Watch Video Solution

104. In a triangle ABC, $a = 2x$, $b = 2y$ and $\widehat{C} = 120^\circ$ then the area of the triangle is

A. xy

B. $xy\sqrt{3}$

C. $3xy$

D. $2xy$

Answer:

Watch Video Solution

105. If $\frac{\tan(B-C)}{2} = x\frac{\cot(A)}{2}$ then $x =$

A. $\frac{c-a}{c+a}$

B. $\frac{a-b}{a+b}$

C. $\frac{b-c}{b+c}$

D. none of these

Answer:

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

A. 0.17013888888889

B. 0.21111111111111

C. not derivable

D. none of these

Answer:

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107. The minimum value of $3\tan^2\theta + 12\cot^2\theta$ is

A. 6

B. 15

C. 24

D. 12

Answer:

Watch Video Solution

108. Maximum value of $\sin^8 x + \cos^{16} x$ is

A. 1

B. $\frac{3}{2}$

C. $\frac{3}{4}$

D. $\frac{1}{2}$

Answer:

Watch Video Solution

109. The minimum value of $\sin\theta.\ \cos\theta$ is

A. 1

B. 0

C. $-\frac{1}{2}$

D. $\frac{1}{2}$

Answer:

Watch Video Solution

110. If $\cos x + \cos y + \cos\alpha = 0$ and $\sin x + \sin y + \sin\alpha = 0$, then $\cot\left(\frac{x+y}{2}\right)$

A. $\sin\alpha$

B. $\cos\alpha$

C. $\cot\alpha$

D. $\sin\left(\frac{x+y}{2}\right)$

Answer:

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111. If $\alpha+\beta+\gamma=2\pi,$ then

A. $\frac{\tan(\alpha)}{2}+\frac{\tan(\beta)}{2}+\frac{\tan(\gamma)}{2}=\frac{\tan(\alpha)}{2}\frac{\tan(\beta)}{2}\frac{\tan(\gamma)}{2}$

B. $\frac{\tan(\alpha)}{2}+\frac{\tan(\beta)}{2}+\frac{\tan(\gamma)}{2}=-\frac{\tan(\alpha)}{2}\cdot\frac{\tan(\beta)}{2}\cdot\frac{\tan(\gamma)}{2}$

C. $\frac{\tan(\alpha)}{2}\cdot\frac{\tan(\beta)}{2}+\frac{\tan(\beta)}{2}\cdot\frac{\tan(\gamma)}{2}+\frac{\tan(\gamma)}{2}\cdot\frac{\tan(\alpha)}{2}=1$

D.

$$\frac{\tan(\alpha)}{2}.\frac{\tan(\beta)}{2}+\frac{\tan(\beta)}{2}.\frac{\tan(\gamma)}{2}+\frac{\tan(\gamma)}{2}.\frac{\tan(\alpha)}{2}=0$$

Answer:

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112. If $\tan\theta+\sec\theta=\sqrt{3}, 0<\theta<\pi$, then θ is equal to or least positive value of θ is

A. $\frac{\pi}{3}$

B. $\frac{\pi}{6}$

C. $\frac{2\pi}{3}$

D. $\frac{5\pi}{6}$

Answer:

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113. If $\tan 25^\circ = x$, then $\frac{\tan 155^\circ - \tan 115^\circ}{1 + \tan 155^\circ . \tan 115^\circ} =$

A. $\frac{1 + x^2}{2x}$

B. $\frac{1 + x^2}{1 - x^2}$

C. $\frac{1 - x^2}{2x}$

D. $\frac{1 - x^2}{1 + x^2}$

Answer:

Watch Video Solution

114. If $x + y + z = \pi, \tan x \tan y = 2 \tan x + \tan y + \tan z = 6,$ then z equals :

A. $n\pi + \frac{\pi}{4}$

B. $n\pi + \tan^{-1} 2$

C. $n\pi + \tan^{-1} 3$

D. $n\pi$

Answer:

Watch Video Solution

115. If $1 + \cos\alpha + \cos^2\alpha + \ldots = 2 - \sqrt{2}$, then$\alpha(0 < \alpha < \pi)$ is

A. $\frac{\pi}{4}$

B. $\frac{\pi}{8}$

C. $\frac{3\pi}{4}$

D. $\frac{\pi}{6}$

Answer:

Watch Video Solution

116. The value of the determinant : $\begin{vmatrix} \sin^2 13^\circ & \sin^2 77^\circ & \tan 135^\circ \\ \sin^2 77^\circ & \tan 135^\circ & \sin^2 13^\circ \\ \tan 135^\circ & \sin^2 13^\circ & \sin^2 77^\circ \end{vmatrix}$ is equal to :

A. -1

B. 0

C. 1

D. 2

Answer:

Watch Video Solution

117. If $\tan A + \tan B + \tan C = \tan A.\ \tan B.\ \tan C$ then

A. A, B, C must be angles of triangle

B. The sum of any two of A, B, C is equal to thi third

C. $A + B + C$ must be an integral multiple of π

D. none of these

Answer:

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118. In a right angled triangle, the hypotenuse four times as long as the perpendicular draw! from the opposite vertex. One of the acute angle is

A. 45°

B. 30°

C. 15°

D. 60°

Answer:

Watch Video Solution

119. If $\sin\theta + \cos\theta = a$ then $\sin^4\theta + \cos^4\theta =$

A. $1 - \frac{1}{2}\left(a^2 - 1\right)^2$

B. $1 + \frac{1}{2}\left(a^2 - 1\right)^2$

C. $\frac{1}{2}\left(a^2 - 1\right)^2$

D. $\frac{1}{2}\left(a^2 + 1\right)^2$

Answer:

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120. If $\sin x + \sin^2 x = 1$ then the value of $\cos^2 x + \cos^4 x$ is

A. 2

B. -1

C. 0

D. $\underline{1}$

Answer:

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121. In a ΔABC angle A is greater than B. If the measures of angles A and B satisfy the equation $3\sin x - 4\sin^3 x - k = 0$, $0 < k < 1$, then the measures of angle C is :

A. $\frac{\pi}{3}$

B. $\frac{2\pi}{3}$

C. $\frac{\pi}{2}$

D. $\frac{5\pi}{6}$

Answer:

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122. $\frac{\cos^2(3\pi)}{5} + \frac{\cos^2(4\pi)}{5} =$

A. $\frac{4}{5}$

B. $\frac{5}{2}$

C. $\frac{5}{4}$

D. $\frac{3}{4}$

Answer:

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123. $\cot\theta = \sin 2\theta, (\theta \neq n\pi),$ if θ

A. 45° or 90°

B. 45° or 60°

C. 90° only

D. 45° only

Answer:

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124. If $\frac{\pi}{2} < \theta < \frac{3\pi}{2}$ then $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}$ equals to

A. $\sec\theta - \tan\theta$

B. $\sec\theta + \tan\theta$

C. $\tan\theta - \sec\theta$

D. none of these

Answer:

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125. If $\alpha \in [-\pi, \pi]$ such that $\sqrt{\frac{1-\sin\alpha}{1+\sin\alpha}} = \sec\alpha - \tan\alpha$

Then

A. $\alpha \in \leq ft\left[0, \frac{\pi}{2}\right)$

B. $\leq ft\left[0, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \pi\right]$

C. $\alpha \in [-\pi, 0]$

D. $\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

Answer:

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126. If $-\frac{\pi}{4} < A < \frac{\pi}{4}$, then $\frac{\sqrt{1+\sin 2A}+\sqrt{1-\sin 2A}}{\sqrt{1+\sin 2A}-\sqrt{1-\sin 2A}}$ is equal to

A. $\tan A$

B. $-\tan A$

C. $\cot A$

D. $-\cot A$

Answer:

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127. If $\tan\theta = -\frac{4}{3}$, then $\sin\theta$ is :

A. $-\frac{4}{5}$ but not $\frac{4}{5}$

B. $-\frac{4}{5}$ or $\frac{4}{5}$

C. $\frac{4}{5}$ but not $-\frac{4}{5}$

D. none of these

Answer:

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128. The greatest value of $\sin x \cos x$ is

A. 1

B. 2

C. $\sqrt{2}$

D. $\frac{1}{2}$

Answer:

Watch Video Solution

129. The value of $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ$ is

A. $-\frac{3}{16}$

B. $\frac{5}{16}$

C. $\frac{3}{16}$

D. $\frac{1}{16}$

Answer:

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130. The value of $\frac{\cos(\pi)}{5}.\frac{\cos(2\pi)}{5}.\frac{\cos(4\pi)}{5}.\frac{\cos(8\pi)}{5}$ is

A. $\frac{1}{16}$

B. 0

C. $-\frac{1}{8}$

D. $-\frac{1}{16}$

Answer:

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131. If $\sin\theta + \cos ec\theta = 2$, then $\sin^2\theta + \cos ec^2\theta =$

A. 1

B. 4

C. 2

D. none of these

Answer:

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132. If $f(x) = \cos^2 x + \sec^2 x$, then

A. $f(x) < 1$

B. $f(x) = 1$

C. $2 < f(x) < 1$

D. $f(x) \geq 2$

Answer:

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133. If $\tan\theta = \frac{1}{2}$ and $\tan\varphi = \frac{1}{3}$ then the value of $\theta + \varphi$ is

A. $\frac{\pi}{6}$

B. π

C. 0

D. $\frac{\pi}{4}$

Answer:

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134. Which of the following is not correct?

A. $\sin\theta = -\frac{1}{5}$

B. $\cos\theta = 1$

C. $\sec\theta = \frac{1}{2}$

D. $\tan\theta = 20$

Answer:

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135. The value of $\tan 1^\circ . \tan 2^\circ . \tan 3^\circ \ldots . \tan 89^\circ$ is

A. (0)

B. 1

C. $\frac{1}{2}$

D. not defined

Answer:

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136. The value of $\frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ}$ is

A. 1

B. $\sqrt{3}$

C. $\frac{\sqrt{3}}{2}$

D. 2

Answer:

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137. If $\tan t\hat{a}$ = 3 and θ lies in third quadrant, then the value of $\sin\theta$ is :

A. $\frac{1}{\sqrt{10}}$

B. $-\frac{1}{\sqrt{10}}$

C. $-\frac{3}{\sqrt{10}}$

D. $\frac{3}{\sqrt{10}}$

Answer:

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138. The value of $\tan 75^\circ - \cot 75^\circ$ is equal to

A. $2\sqrt{3}$

B. $2+\sqrt{3}$

C. $2-\sqrt{3}$

D. 1

Answer:

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139. Sin $(45^\circ + \theta) - \cos(45^\circ - \theta)$ is equal to :

A. $2\cos\theta$

B. $2\sin\theta$

C. 1

D. 0

Answer:

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140. $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ =$

A. $\frac{1}{2}$

B. 1

C. $-\frac{1}{2}$

D. 8

Answer:

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141. If $\tan A = \frac{1}{2}, \tan B = \frac{1}{3}$ then tan $(2A + B)$ is equal to

A. 1

B. 2

C. 3

D. 4

Answer:

Watch Video Solution

142. The value of $\frac{\sin(\pi)}{10}\frac{\sin(13\pi)}{10}$ is

A. $\frac{1}{2}$

B. $-\frac{1}{2}$

C. $-\frac{1}{4}$

D. 1

Answer:

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143. The value of $\sin 50^\circ - \sin 70^\circ + \sin 10^\circ$ is equal to

A. 1

B. 0

C. $\frac{1}{2}$

D. 2

Answer:

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144. If $\sin\theta + \cos\theta = 1$ then the value of $\sin 2\theta$ is equal to

A. 1

B. $\frac{1}{2}$

C. 0

D. -1

Answer:

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145. If $\alpha + \dot{\beta} = \frac{\pi}{4}$, then the value of $(1 + \tan\alpha)(1 + \tan\beta)$

A. 1

B. 2

C. -2

D. not defined

Answer:

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146. If $\sin\theta = -\frac{4}{5}$ and θ lies in 3 quadrant then the value of $\cos\left(\frac{\theta}{2}\right)$ is

A. $\frac{1}{5}$

B. $-\frac{1}{\sqrt{10}}$

C. $-\frac{1}{\sqrt{5}}$

D. $\frac{1}{\sqrt{10}}$

Answer:

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147. The value of $\sin\left(\frac{\pi}{18}\right)+\sin\left(\frac{\pi}{9}\right)+\sin 2\left(\frac{\pi}{9}\right)+\sin 5\left(\frac{\pi}{18}\right)$ is given by

A. $\sin\left(7\frac{\pi}{18}\right)+\sin\left(4\frac{\pi}{9}\right)$

B. 1

C. $\cos\left(\frac{\pi}{6}\right)+\cos\left(3\frac{\pi}{7}\right)$

D. $\cos\left(\frac{\pi}{9}\right)+\sin\left(\frac{\pi}{9}\right)$

Answer:

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148. If A lies in the second quadrant and $3\tan A + 4 = 0$ then the value of $2\cot A - 5\cos A + \sin A$ is equal to

A. $-\frac{53}{10}$

B. $\frac{23}{10}$

C. $\frac{37}{10}$

D. $\frac{7}{10}$

Answer:

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149. The value of $\cos^2 48^\circ - \sin^2 12^\circ$ is

A. $\frac{\sqrt{5}+1}{2\sqrt{2}}$

B. $\frac{\sqrt{5}+1}{8}$

C. $\frac{\sqrt{5}-1}{8}$

D. $\frac{\sqrt{5}+1}{5}$

Answer:

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150. If $\tan\alpha = \frac{1}{7}, \tan\beta = \frac{1}{3},$ then $\cos 2\alpha$ is equal to

A. $\sin 2\beta$

B. $\sin 4\beta$

C. $\sin 3\beta$

D. $\cos 2\beta$

Answer:

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151. If $\tan\theta = \frac{a}{b}$, then $b\cos 2\theta + a\sin 2\theta$ is equal to

A. a

B. b

C. $\frac{a}{b}$

D. none

Answer:

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152. In a triangle $ABC, \widehat{A} = 30^\circ, b = 8, a = 6,$ then $b = \sin^{-1} x,$ where $x =$

A. $\frac{1}{2}$

B. $\frac{1}{3}$

C. $\frac{2}{3}$

D. 1

Answer:

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153. In the triangle $ABC, a = 13, b = 14, c = 15$ then $\frac{\sin(A)}{2} =$

A. $\sqrt{\frac{1}{5}}$

B. $\frac{2}{\sqrt{5}}$

C. $\frac{3}{\sqrt{5}}$

D. $\frac{4}{\sqrt{5}}$

Answer:

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154. If $\tan A = \frac{1}{3}, \tan B = \frac{2}{7}$ then $\cot(A + B) =$

A. 23

B. 32

C. $\frac{1}{23}$

D. $\frac{19}{13}$

Answer:

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155. If $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ then the ΔABC is

A. isosceles

B. right angled

C. equilateral

D. no conclusion

Answer:

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156. In a triangle ABC, if a, b, c are in A.P then $\frac{\tan(A)}{2}, \frac{\tan(B)}{2}, \frac{\tan(C)}{2}$ are in

A. AP

B. GP

C. HP

D. none of these

Answer:

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157. $4\cos 36^\circ + \cot\left(7\frac{1}{2}\right)^\circ =$

A. 1+sqrt(2)+sqrt(3)+sqrt(4)+sqrt(5)+sqrt(6)

B. $\sqrt{5}+1$

C. $\sqrt{1}+\sqrt{2}+\sqrt{3}+\sqrt{4}+\sqrt{5}+\sqrt{6}$

D. $\sqrt{5}+\sqrt{3}$

Answer:

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158. If $a = 5, b = 13, c = 12$ in a triangle ABC, then $\tan\left(\frac{B}{4}\right) =$

A. $\sqrt{3} - 1$

B. $\sqrt{3} + 1$

C. $\sqrt{2} + 1$

D. $\sqrt{2} - 1$

Answer:

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159. The value of $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \ldots + \sin^2 90^\circ$ is equal to

A. $7\frac{1}{2}$

B. $8\frac{1}{2}$

C. 9

D. $9\frac{1}{2}$

Answer:

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160. The triangle ABC is right angled at C, then $\tan A + \tan B =$

A. $a + b$

B. $\frac{a^2}{bc}$

C. $\frac{c^2}{ab}$

D. $\frac{b^2}{ac}$

Answer:

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161. The value of $\frac{\cot 54^\circ}{\tan 36^\circ} + \frac{\tan 20^\circ}{\cot 70^\circ} =$

A. 1

B. 0

C. 2

D. 3

Answer:

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162. If A and B are two points of a circle of radius r with centre at the point O and $\angle AOB = \theta$ (in radians) then the area of the sector AOB is

A. $2\pi r$

B. πr^2

C. $\frac{1}{2}r^2\theta$

D. $r\theta$

Answer:

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163. The value of $\cos^2\frac{\pi}{12} + \cos^2\frac{\pi}{4} + \cos^2\frac{5\pi}{12}$ is

A. $\frac{3+\sqrt{3}}{2}$

B. $\frac{2}{3+\sqrt{3}}$

C. $\frac{2}{3}$

D. $\frac{3}{2}$

Answer:

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164. Radii of two circles are 5 cm and 3 cm respectively and the distance between their centres is 6 cm.

A. $\frac{5\pi+6\sqrt{3}}{6}$

B. $\frac{19\pi+6\sqrt{3}}{6}$

C. $\frac{5\pi-6\sqrt{3}}{6}$

D. $\frac{\pi}{6}$

Answer:

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165. In a ΔABC if $\begin{vmatrix} 1 & a & b \\ 1 & c & a \\ 1 & b & c \end{vmatrix} = 0$ then

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

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166. The acute angle in radians between the minute and the hour hands of a clock when the time is 4 hour 20 minutes is

A. 0

B. $\frac{\pi}{18}$

C. $\frac{\pi}{9}$

D. $\frac{\pi}{6}$

Answer:

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167. If $0 < x < \frac{\pi}{2}$, then the largest angle of a triangle whose sides are 1, sinx, cosx is

A. $\frac{\pi}{2}$

B. $\frac{\pi}{3}$

C. $\frac{\pi}{2} - x$

D. x

Answer:

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168. $\cos 1^\circ + \cos 2^\circ + \cos 3^\circ + \ldots + \cos 180^\circ =$

A. 1

B. 2

C. 2

D. -1

Answer:

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169. The value of $\frac{\tan 70^\circ - \tan 20^\circ}{\tan 50^\circ} =$

A. 2

B. 1

C. 0

D. 3

Answer:

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170. The circum-radius of the triangle whose sides are 13, 12 and 5 is...

A. $\frac{15}{2}$

B. 6

C. 15

D. $\frac{13}{2}$

Answer:

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171. IfA+B+C = 180° then $\sum \frac{\tan(A)}{2}\frac{\tan(B)}{2}$=

A. 0

B. 1

C. 2

D. 3

Answer:

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172. If $0 \leq x \leq \pi$ and $81^{\sin^{2x}} + 81^{\cos^{2x}} = 30$ then x=

A. $\frac{\pi}{6}$

B. $\frac{\pi}{2}$

C. $\frac{\pi}{4}$

D. $\frac{3\pi}{4}$

Answer:

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173. In a $\triangle ABC$ if the sides are a =3, b = 5 and c = 4then $\sin\left(\frac{B}{2}\right) + \cos\left(\frac{B}{2}\right)$ is equal to

A. $\frac{\sqrt{3}-1}{2}$

B. $\underline{1}$

C. $\sqrt{2}$

D. $\frac{\sqrt{3}+1}{2}$

Answer:

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174. If $12\cot^2\theta - 31\cos ec\theta + 32 = 0$ then the value of $\sin\theta$is...

A. $\frac{4}{5}$ or $\frac{3}{4}$ (b) $\pm\frac{1}{2}$

B. $\pm\frac{1}{2}$

C. $\frac{3}{5}$ or 1

D. $\frac{2}{3}$ or $-\frac{2}{3}$

Answer:

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175. The value of $\cos(270^\circ + \theta)\cos(90^\circ - \theta) - \sin(270^\circ - \theta)\cos\theta$ is...

A. $\frac{1}{2}$

B. 1

C. 0

D. -4

Answer:

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176. If the angles of a triangle are in the ratio $3:4:5$, then the sides are in the ratio

A. 0.12783564814815

B. $2:\sqrt{3}:\sqrt{3}+1$

C. $\sqrt{2}:\sqrt{6}:\sqrt{3}+1$

D. $2:\sqrt{6}:\sqrt{3}+1$

Answer:

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177. If $\sec\theta = m$ and $\tan\theta = n$, then $\frac{1}{m}\left[(m+n) + \frac{1}{(m+n)}\right] =$

A. mn

B. $2n$

C. $2m$

D. 2

Answer:

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178. From an aeroplane flying, vertically above a horizontal road, the angels of depression of two consecutive stones on the same side of the aeroplane are observed to be 30° and 60° respectively. The height at which the aeroplane is flying in km is

A. 2

B. $\frac{2}{\sqrt{3}}$

C. $\frac{\sqrt{3}}{2}$

D. $\frac{4}{\sqrt{3}}$

Answer:

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179. $\sin^2 17.5^\circ + \sin^2 72.5^\circ$ is equal to

A. $\tan^2 45^\circ$

B. $\cos^2 90^\circ$

C. $\sin^2 45^\circ$

D. $\cos^2 30^\circ$

Answer:

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180. The value of $\frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ}$ is

A. 1

B. $\sqrt{3}$

C. $\frac{\sqrt{3}}{2}$

D. 2

Answer:

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181. The sides of a triangle are $3x + 4y$, $4x + 3y$ and $5x + 5y$, where $x, y > 0$, then the triangle is

A. right angled

B. obtuse angled

C. equilateral

D. none of these

Answer:

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182. If $\tan\theta = -\frac{4}{3}$, then $\sin\theta$ is :

A. $-\frac{4}{5}$ but not $\frac{4}{5}$

B. $-\frac{4}{5}$ or $\frac{4}{5}$

C. $\frac{4}{5}$ but not $-\frac{4}{5}$

D. none of these

Answer:

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183. The number of values of x in the interval $[0, 3\pi]$ satisfying the equation $2\sin^2 x + 5\sin x - 3 = 0$ is :

A. 4

B. 1

C. 1

D. 2

Answer:

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184. In a triangle ABC, if $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ and $a = 2$ then its area is

A. 1

B. 2

C. $\frac{\sqrt{3}}{2}$

D. $\sqrt{3}$

Answer:

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185.

$3(\sin x - \cos x)^4 + 6(\sin x + \cos x)^2 + 4\left(\sin^6 x + \cos^6 x\right) =$

A. 11

B. 12

C. 13

D. 14

Answer:

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186. The number of values of x in the interval $[0, 5\pi]$ satisfying the equation $3\sin^2 x - 7\sin x + 2 = 0$ is :

A. 0

B. 5

C. 6

D. 10

Answer:

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187. In a triangle PQR, $\angle R = \pi/2$, If $\tan(P/2).$ and $\tan(Q/2)$ are the roots of the equation : $ax^2 + bx + c = 0a \neq 0$, then :

A. $a + b = c$

B. $b + c = a$

C. $a + c = b$

D. $b = c$

Answer:

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188. The maximum value of : $(\cos\alpha_1).(\cos\alpha_2)....(\cos\alpha_n)$ under the restrictions $:0 \leq \alpha_1, a_2, ..., \alpha_n \leq \frac{\pi}{2}$ and $(\cot\alpha_1)(\cot\alpha_2).... .(\cot\alpha_n) = 1$ is :

A. $\frac{1}{2^{\frac{n}{2}}}$

B. $\frac{1}{2^n}$

C. $-\frac{1}{2^n}$

D. 1

Answer:

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189. A man from the top of a 100 metres high lower sees a car towards the tower at an angle of degression of 30°. After some time, the angle of depression becomes 60°. The distance metres travelled by the car during this time

A. $100\sqrt{3}$

B. $\frac{200\sqrt{3}}{3}$

C. $\frac{100\sqrt{3}}{3}$

D. $200\sqrt{3}$

Answer:

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190. If $0 < \theta < 2\pi$, then the intervals of values of θ for which $2\sin^2\theta - 5\sin\theta + 2 > 0$, is :

A. $\left(0, \frac{\pi}{6}\right) \cup \left(\frac{5\pi}{6}, 2\pi\right)$

B. $\left(\frac{\pi}{6}, \frac{5\pi}{6}\right)$

C. $(0, \pi)$

D. $\left(\frac{\pi}{2}, 2\pi\right)$

Answer:

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191. Given $A = \sin^2\theta + \cos^4\theta$ then for all real θ

A. $1 \leq A \leq 2$

B. $\frac{3}{4} \leq A \leq 1$

C. $0 \leq A \leq 1$

D. $\frac{1}{4} \leq A \leq \frac{1}{2}$

Answer:

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192. $\frac{3\cos\theta + \cos 3\theta}{3\sin\theta - \sin 3\theta} =$

A. $\cot^2\theta$

B. $\cot^4\theta$

C. $\cot^3\theta$

D. $2\cot\theta$

Answer:

Watch Video Solution

193. If $x = \sqrt{\frac{1-\cos\theta}{1+\cos\theta}}$, then $\frac{2x}{1-x^2} =$

A. $\sin\theta$

B. $\cos\theta$

C. $\tan\theta$

D. $\cot\theta$

Answer:

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194. $\cos\alpha\sin(\beta-\gamma)+\cos\beta\sin(\gamma-\alpha)+\cos\gamma(\sin\alpha-\beta)=$

A. $\underline{0}$

B. $\frac{1}{2}$

C. 1

D. $4\cos\alpha\cos\beta\cos\gamma$

Answer:

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195. $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ =$

A. $\frac{1}{2}$

B. $\frac{1}{4}$

C. $-\frac{1}{4}$

D. $-\frac{1}{2}$

Answer:

Watch Video Solution

196. In a $\Delta ABC, \tan.\frac{A}{2} = \frac{5}{6}, \tan.\frac{C}{2} = \frac{2}{5}$, then

A. $b^2 + ac$

B. $2b = a + c$

C. $2ac = b(a + c)$

D. $a + b = c$

Answer:

Watch Video Solution

197. If the angles of depression of the upper and lower ends of a lamp post from the top of a hill of height h metres are α and β respectively, the height of the lamp post (in metres) is

A. $h \sin(\beta - \alpha)$

B. $\frac{h \sin(\beta - \alpha)}{\sin \beta}$

C. $\frac{h \sin(\beta - \alpha)}{\cos \alpha \cos \beta}$

D. $\frac{h\sin(\beta-\alpha)}{\cos\alpha.\sin\beta}$

Answer:

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198. A tower, x metres, has a flagstaff at its top. The tower and the flagstaff subtend equal angles at a point distant y metres from the foot of the tower. The length of the flagstaff (in metres) is

A. $\frac{y(x^2-y^2)}{x^2+y^2}$

B. $\frac{x(y^2+x^2)}{y^2-x^2}$

C. $\frac{x(x^2+y^2)}{x^2-y^2}$

D. $\frac{x(x^2-y^2)}{x^2+y^2}$

Answer:

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199. $\cos 12^\circ + \cos 84^\circ + \cos 156^\circ + \cos 132^\circ =$

A. $\frac{1}{2}$

B. 1

C. $-\frac{1}{2}$

D. $\frac{1}{8}$

Answer:

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200. The value of : $\sin\left(\frac{\pi}{7}\right).\sin\left(\frac{3\pi}{14}\right).\sin\left(\frac{5\pi}{14}\right).\sin\left(\frac{7\pi}{14}\right)$ is :

A. $\frac{1}{16}$

B. $\frac{1}{64}$

C. $\frac{1}{128}$

D. $\frac{1}{32}$

Answer:

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201. Let $f(\theta) = \sin\theta(\sin\theta + \sin 3\theta)$ then $f(\theta)$:

A. ≥ 0 only when $\theta \geq 0$

B. ≤ 0 for all real θ

C. ≥ 0 for all real values of θ

D. ≤ 0 only when $\theta \leq 0$

Answer:

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202. In a triangle ABC, $2ca \sin. \frac{A-B+C}{2} =$

A. $a^2 + b^2 - c^2$

B. $c^2 + a^2 - b^2$

C. $b^2 - c^2 - a^2$

D. $c^2 - a^2 - b^2$

Answer:

Watch Video Solution

203. If $\sin x + \sin^2 x = 1$ then the value of $\cos^2 x + \cos^4 x$ is

A. 1

B. 2

C. 1.5

D. none of these

Answer:

Watch Video Solution

204. $\cos\alpha\sin(\beta-\gamma)+\cos\beta\sin(\gamma-\alpha)+\cos\gamma(\sin\alpha-\beta)=$

A. 0

B. $\frac{1}{2}$

C. 1

D. $4\cos\alpha\cos\beta\cos\gamma$

Answer:

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205. If two angles of a triangle are 45° and 60°, then the ratio of the smallest and greatest sides are

A. $\left(\sqrt{3}-1\right):1$

B. $\sqrt{3}:\sqrt{2}$

C. $1:\sqrt{3}$

D. $\sqrt{3}:1$

Answer:

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206. Show that $\sqrt{3}\ \operatorname{cosec}\ 20^\circ - \sec 20^\circ = 4$

A. 2

B. 1

C. 4

D. -4

Answer:

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207. If $f(x) = \cos^2 x + \sec^2 x$, then

A. $f(x) < 1$

B. $f(x) = 1$

C. $2 > f(x) > 1$

D. $f(x) \geq 2$

Answer:

Watch Video Solution

208. The value of $\log \tan 1^\circ + \log \tan 2^\circ + \ldots + \log \tan 89^\circ$ is

A. 0

B. -1

C. 1

D. ∞

Answer:

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209. If α and β be between 0 and $\frac{\pi}{2}$ and if $\cos(\alpha+\beta)=\frac{12}{13}$ and $\sin(\alpha-\beta)=\frac{3}{5}$, then $\sin 2\alpha$ is equal to

A. $\frac{64}{65}$

B. $\frac{56}{65}$

C. 0

D. $\frac{16}{15}$

Answer:

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210. The expression $\frac{\cos 6x+6\cos 4x+15\cos x+10}{\cos 5x+5\cos 3x+10\cos x}$ is equal to

A. $\cos^2 x$

B. $1 + \cos x$

C. $\cos 2x$

D. $2 \cos x$

Answer:

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211. If $\sin A + \sin B = a$ and $\cos A + \cos B = b$ then $\cos(A + B) =$

A. $\frac{a^2 + b^2}{b^2 - a^2}$

B. $\frac{2ab}{a^2 + b^2}$

C. $\frac{b^2 - a^2}{a^2 + b^2}$

D. $\frac{a^2 - b^2}{a^2 + b^2}$

Answer:

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212. The maximum value of $12\sin\theta - 9\sin^2\theta$ is

A. 3

B. 4

C. 5

D. 2

Answer:

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213. The value of $\frac{\cos(2\pi)}{7} + \frac{\cos(4\pi)}{7} + \frac{\cos(6\pi)}{7}$ is

A. 1

B. -1

C. $\frac{1}{2}$

D. $-\frac{1}{2}$

Answer:

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214. If $\tan(\pi\cos\theta) = \cot(\pi\sin\theta), 0 < \theta < \frac{3\pi}{4}$ then, $\sin\left(\theta + \frac{\pi}{4}\right)$ equals

A. $\frac{1}{\sqrt{2}}$

B. $\frac{1}{2}$

C. $\frac{1}{2\sqrt{2}}$

D. $\sqrt{2}$

Answer:

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215. If $\sin(x-y)=\cos(x+y)=\frac{1}{2}$, the value of x and y lying between 0° and 90° are given by

A. $x=15^\circ, y=25^\circ$

B. $x=65^\circ, y=15^\circ$

C. $x=45^\circ, y=45^\circ$

D. $x=45^\circ, y=15^\circ$

Answer:

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216. If $\tan(\pi\cos\theta) = \cot(\pi\sin\theta)$, then $\cos\left(\theta - \frac{\pi}{4}\right)$ is :

A. $\frac{1}{\sqrt{2}}$

B. $\frac{1}{2\sqrt{2}}$

C. $-\frac{1}{2\sqrt{2}}$

D. $-\frac{1}{\sqrt{2}}$

Answer:

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217. If $1 + \sin x + \sin^2 x + \sin^3 x + ... + \infty$ is equal to $4 + 2\sqrt{3}, 0 < x < \pi,$ then $x =$

A. $\frac{\pi}{6}$

B. $\frac{\pi}{4}$

C. $\frac{\pi}{3}$ or $\frac{\pi}{6}$

D. $\frac{\pi}{3}$ or $\frac{2\pi}{3}$

Answer:

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218. Given $A = \sin^2\theta + \cos^4\theta$ then for all real θ

A. $1 \leq A \leq 2$

B. $\frac{3}{4} \leq A \leq 1$

C. $\frac{13}{16} \leq A \leq 1$

D. $\frac{3}{4} \leq A \leq \frac{13}{16}$

Answer:

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219. The value of $\left(1+\frac{\cos(\pi)}{8}\right)\left(1+\frac{\cos(3\pi)}{8}\right)\left(1+\frac{\cos(5\pi)}{8}\right)\left(1+\frac{\cos(7\pi)}{8}\right)$ is

A. $\frac{1}{2}$

B. $\frac{\cos(\pi)}{8}$

C. $\frac{1}{8}$

D. $\frac{1+\sqrt{2}}{2\sqrt{2}}$

Answer:

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220. If $\sin^3 x \sin 3x = \sum_{r=0}^{n} a_r \cos rx$ is an identity in x, then $n =$

A. 3

B. 4

C. 6

D. 9

Answer:

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221. The expression $\tan^2\alpha + \cot^2\alpha$ is

A. ≥ 2

B. ≤ 2

C. ≥ -2

D. none of these

Answer:

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222. The maximum value of $\cos^2\left(\frac{\pi}{3}-x\right)-\cos^2\left(\frac{\pi}{3}+x\right)$ is

A. $\frac{\sqrt{3}}{2}$

B. $\frac{1}{2}$

C. $-\frac{\sqrt{3}}{2}$

D. $\frac{3}{2}$

Answer:

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223. If $\sin x+\cos ecx=2$, then $\sin^n x+\cos ec^n x=$

A. 2

B. 2^{π}

C. 2^{n-1}

D. 2^{n-2}

Answer:

Watch Video Solution

224. If $\sin\theta + \cos ec\theta = 2$ then the value of $\sin^{10} x + \cos ec^{10} x$ is

A. 2

B. 2^4

C. 2^8

D. none of these

Answer:

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225. The value of $16\sin 144^\circ \sin 108^\circ \sin 72^\circ \sin 36^\circ$ is equal to

A. 5

B. 4

C. 3

D. 1

Answer:

Watch Video Solution

226. If $\tan(A+B)=p$ and $\tan(A-B)=q,$ then the value of $\tan 2A$ is

A. $\frac{p+q}{p-q}$

B. $\frac{p-q}{1+pq}$

C. $\frac{1+pq}{1-p}$

D. $\frac{p+q}{1-pq}$

Answer:

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227. The angle of elevation of the top of a TV tower from three points A,B and C in a straight line through the foot of the tower are $\alpha, 2\alpha$ and 3α respectively . If $AB=a$, the height of the tower is

A. $a \sin \alpha$

B. $a \tan \alpha$

C. $a \sin 3\alpha$

D. $a \sin 2\alpha$

Answer:

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228. The angles A,B and C of a triangle ABC are in A.P. If $b : c = \sqrt{3} : \sqrt{2}$, then the angle A is

A. 15°

B. 30°

C. 45°

D. 75°

Answer:

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229. The value of $\tan 67\frac{1^0}{2} + \cot 67\frac{1^\circ}{2}$ is

A. $3\sqrt{2}$

B. $\sqrt{2}$

C. $2 - \sqrt{2}$

D. $2\sqrt{2}$

Answer:

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230. The perimeter of a certain sector of a circle is equal to the length of the are of the semicircle . Then the angle at the centre of the sector in radians is

A. $\pi + 2$

B. $\pi - 2$

C. $\frac{2\pi}{3}$

D. $\frac{\pi}{3}$

Answer:

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231. If $\sqrt{\frac{1+\cos A}{1-\cos A}} = \frac{x}{y}$, then the value of tan A =

A. $\frac{2xy}{x^2+y^2}$

B. $\frac{x^2+y^2}{x^2-y^2}$

C. $\frac{2xy}{y^2-x^2}$

D. $\frac{2xy}{x^2-y^2}$

Answer:

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232. Which one of the following is possible?

A. $\tan\theta = 45$

B. $\cos\theta = \frac{7}{3}$

C.) sin theta=(a^(2)+b^(2))/(a^(2)-b^(2)),(a neq b)

D. $\sin\theta = \frac{5}{4}$

Answer:

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233. If one side of a triangle is double the other and the angles opposite to these sides differ by 60°, then the triangle is

A. isosceles

B. right angled

C. obtuse angled

D. acute angled

Answer:

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234.

$3(\sin x - \cos x)^4 + 6(\sin x + \cos x)^2 + 4\left(\sin^6 x + \cos^6 x\right) =$

A. 14

B. 11

C. 12

D. 13

Answer:

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235. A cow is tied to a post by a rope. The cow moves along the circular path always keepign the rope tight. If it describes 44 metre, when it has traced ut $72^\circ k$ at the centre, the length of the rope is

A. $45mt$

B. $35mt$

C. $22mt$

D. $56mt$

Answer:

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236. If $\begin{vmatrix} 1+\sin^2\theta & \cos^2\theta & 4\sin 2\theta \\ \sin^2\theta & 1+\cos^2\theta & 4\sin 2\theta \\ \sin^2\theta & \cos^2\theta & 4\sin 2\theta - 1 \end{vmatrix} = 0$ and $0 < \theta < \frac{\pi}{2}$ then $\cos 4\theta =$

A. $-\frac{1}{2}$

B. $\frac{1}{2}$

C. $\frac{\sqrt{3}}{2}$

D. 0

Answer:

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237. $(\sin\theta + \cos\theta)(\tan\theta + \cot\theta) =$

A. $\sec\theta.\ \cos ec\theta$

B. $\sec\theta + \cos ec\theta$

C. 1

D. $\sec\theta.\ \cos\theta$

Answer:

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238. The sides of a triangle are $6 + \sqrt{12}, \sqrt{48}$ and $\sqrt{24}$. The tangent of the smallest angle of the triangle is

A. 1

B. $\sqrt{3}$

C. $\sqrt{2}-1$

D. $\frac{1}{\sqrt{3}}$

Answer:

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239. $\cot 12^\circ \cot 102^\circ + \cot 102^\circ \cot 66^\circ$ +cot 66^(circ) cot 12^(circ)

A. 2

B. -1

C. 1

D. -2

Answer:

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240. $\sin 10^\circ . \sin 30^\circ . \sin 50^\circ . \sin 70^\circ =$

A. $\frac{1}{8}$

B. $\frac{3}{16}$

C. $\frac{\sqrt{3}}{16}$

D. $\frac{1}{16}$

Answer:

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241. Angles of elevatiobn of the top of a tower from three points (collinear) A,B and C on a road leading to the foot of the tower are 30°, 45° and 60° respectively .The ratio of AB to BC is

A. $\sqrt{3}:1$

B. $\sqrt{3}:2$

C. 0.043055555555556

D. $2:\sqrt{3}$

Answer:

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242. If any triangle ABC, the simplified form of $\frac{\cos 2A}{a^2} - \frac{\cos 2B}{b^2}$ is

A. $a^2 - b^2$

B. $\frac{1}{a^2 - b^2}$

C. $\frac{1}{a^2} - \frac{1}{b^2}$

D. $a^2 + b^2$

Answer:

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243. A value of θ satisfying $\sin 5\theta - \sin 3\theta + \sin \theta = 0$ such that $0 < \theta < \frac{\pi}{2}$ is

A. $\frac{\pi}{12}$

B. $\frac{\pi}{6}$

C. $\frac{\pi}{4}$

D. $\frac{\pi}{2}$

Answer:

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244. If $\tan A - \tan B = x$ and $\cot B - \cot A = y$, then $\cot(A - B) =$

A. $\frac{1}{y} - \frac{1}{x}$

B. $\frac{1}{x} - \frac{1}{y}$

C. $\frac{1}{x} + \frac{1}{y}$

D. none of these

Answer:

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245. The value of $\cos^2\frac{\pi}{12}+\cos^2\frac{\pi}{4}+\cos^2\frac{5\pi}{12}$ is

A. $\frac{3}{2}$

B. $\frac{3+\sqrt{3}}{2}$

C. $\frac{2}{3}$

D. $\frac{2}{3+\sqrt{3}}$

Answer:

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246. If $\sin\theta, \cos\theta, \tan\theta$ are in G.P, then $\cot^6\theta-\cot^2\theta$ is

A. 1

B. $\frac{1}{2}$

C. 2

D. 3

Answer:

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247. $\frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ} =$

A. 1

B. $\sqrt{3}$

C. $\frac{\sqrt{3}}{2}$

D. 2

Answer:

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248. $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \ldots + \sin^2 90^\circ =$

A. 8

B. 9

C. 10

D. 9.5

Answer:

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249. If $0 < \theta < \frac{\pi}{2}$ and $\tan\theta + \sec\theta = p$ then $\sec\theta =$

A. $\frac{p^2+1}{p^2}$

B. $\frac{p^2+1}{\sqrt{p}}$

C. $\frac{p^2+1}{2p}$

D. $\frac{p+1}{2p}$

Answer:

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250. $\sin 10^\circ + \sin 20^\circ + \sin 30^\circ + \ldots + \sin 360^\circ =$

A. 0

B. 1

C. $\sqrt{3}$

D. 2

Answer:

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251. $\sqrt{2+\sqrt{2+\sqrt{2+2\cos 8\theta}}} =$

A. $2\sin\theta$

B. $2\frac{\cos(\theta)}{2}(c)\sin 2\theta$

C. sin 2 theta`

D. $2\cos\theta$

Answer:

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