MATHS

BOOKS - MARVEL MATHS (HINGLISH)

TRIGONOMETRIC FUNCTIONS

Examples

1. Show / Prove/ Verify the following :

$$\frac{\sin^2\frac{\pi}{6}+\cos^2\frac{\pi}{3}+\tan^2\frac{\pi}{6}}{\sec^2\frac{\pi}{4}-\cos^2\pi}=\frac{1}{3}.\cos\frac{\pi}{3}+\frac{1}{\sqrt{3}}\sec\frac{\pi}{6}$$

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2. Find the acute angle θ satisfying the equation $2\sin^2\theta-2\sqrt{2}\sin\theta+1=0.$

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3. Find the acute angle A and B such that

$\sec A \cdot \tan B - \sec A - 2\tan B + 2 = 0.$

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4. Find the acute angles A and B such that $\cot(A+B) = \frac{1}{\sqrt{3}}$ and $\sec(A-B) = \frac{2}{\sqrt{3}}.$

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5. If $\sin\theta = 4/5, where \pi/2 < \theta < \pi,$

evaluate : $\frac{\sec\theta + \tan\theta}{\cos ec\theta - \cot\theta}$

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6. If $\tan\theta = -3/5$ and θ is not in the second quadrant, find the values of $\sec\theta$ and $\operatorname{cosec}\theta$.

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7. If $13\ \sin\alpha = 12,$ where $\pi/2 < \alpha < \pi,$ and $3\sec\beta = 5,$ where $3\pi/2 < \beta < 2\pi,$ evaluate : $5\tan\alpha + 3\tan^2\beta.$

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8. Given $\cot\theta = a/b,$

find the value of : $\dfrac{a\cdot\cos\theta - b\cdot\sin\theta}{a\cdot\cos\theta + b\cdot\sin\theta}$

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9. If $\sec\theta + \tan\theta = m,$

show that : $\sin\theta = \dfrac{m^2-1}{m^2+1}$

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10. If θ is any real number, find the value of the exprssion :

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

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11. If $\sin\theta + \cos ec\theta = 2,$ then find th value of $\sin^n\theta + \cos ec^n\theta,$ where is any real number.

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12. If $2\cos x = 2 - \sin x,$ find the value of sin x if x is an acute angle.

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13. Find the acute angle θ, if :

$3\cos ec^2\theta - 2\sec\theta = 0.$

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14. Find the acute angle θ such that :

$2\sin\theta - \sqrt{3}\sec\theta + 1 = 0.$

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15. Eliminate θ from the equations :

$x = a \cdot \sin^5\theta, y = a\cos^5\theta.$

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16. Eliminate$\psi(\text{psi})$ from the equations :

$x = 4\text{cosec}\quad\psi + 5\cot\psi, y = 5\cos ec\psi + 4\cot\psi.$

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17. Eliminate t from the following equations :

$x = at^2, y = 2at.$

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18. If $a\cos\theta - b\sin\theta = c,$ show that

$a\sin\theta + b\cos\theta = \pm\sqrt{a^2 + b^2 - c^2}$

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19. $\sin\alpha - \cos\alpha = m,$

show that : $\sin^3\alpha - \cos^3\alpha = \frac{3m - m^3}{2}.$

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20. If $\sin\theta = \dfrac{a^2 + 2ab}{a^2 + 2ab + 2b^2}$,
show that : $\tan\theta = \dfrac{a^2 + 2ab}{2ab + 2b^2}$.

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21. Find the value of $\sin 75^\circ$.

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22. Using Addition and Subtraction Theorem, find the value $\cos 75^\circ$

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23. Using Addition and Subtraction Theorem, find the value tan15∘

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24. Prove that :

$$\cos(A-B)=\cos\left(\frac{\pi}{6}+A\right).\cos\left(\frac{\pi}{6}+B\right)+\sin\left(\frac{\pi}{6}+A\right).\sin\left(\frac{\pi}{6}+B\right).$$

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25. Show that: $\tan(A+B).\tan(A-B)=\frac{\sin^2 A-\sin^2 B}{\cos^2 A-\sin^2 B}.$

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26. Show that: $\tan 50^\circ-\tan 30^\circ-\tan 20^\circ=\tan 20^\circ.\tan 30^\circ.\tan 50^\circ$

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27. Prove that : $\tan 22^\circ+\tan 23^\circ+\tan 22^\circ.\tan 23^\circ=1.$

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28. Prove that : $\tan 53^\circ = \tan 37^\circ + 2\tan 16^\circ$.

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29. The value of $\frac{\tan 70^0 - \tan 20^0}{\tan 50^0} =$

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30. If $\cos(A - B) = 3/5$ and $\tan A . \tan B = 2$, evalute : $\cos A . \cos B$.

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31. If $\tan A - \tan B = x$, and $\cot B - \cot A = y$, then find the value of $\cot(A - B)$.

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32. If $\tan(\pi\cos\theta) = \cot(\pi\sin\theta)$ then $\sin\left(\theta + \frac{\pi}{4}\right)$ equals

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33. If $\alpha + \beta = 45^\circ$, show that : $(1+\tan\alpha)(1+\tan\beta) = 2$. Hence, find the value of $\tan\left(22\frac{1^\circ}{2}\right)$.

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34. If $\sin(x - 30^\circ) = 2.\cos(x - 60^\circ)$, show that , $\tan x = -\sqrt{3}$.

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35. If $3\tan\theta.\tan\phi = 1$. evalute: $\frac{\cos(\theta-\phi)}{\cos(\theta+\phi)}$.

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36. If $\sin x + \sin y = a, \cos x + \cos y = b$, then what is the value of $\cos(x - y)$?

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37. If $\cos(\alpha + \beta) = \frac{4}{5}; \sin(\alpha - \beta) = \frac{5}{13}$ and α, β lie between $0 \& \frac{\pi}{4}$ then find the value of $\tan 2\alpha$

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38. The value of $\frac{\sin(-660^\circ)\tan(1050^\circ)\sec(420^\circ)}{\cos(225^\circ)\cos ec(315^\circ)\cos(510^\circ)}$ is:

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39. $4 - \cot\left(\frac{\pi}{4} + \theta\right)\cot\left(\frac{\pi}{4} - \theta\right) = 1$

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40. $\cos^2\left(\frac{\pi}{4}-\theta\right)+\cos^2\left(\frac{\pi}{4}+\theta\right)=\ldots.$

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41. Prove that :

$\tan 15^\circ.\tan 25^\circ+\tan 25^\circ.\tan 50^\circ+\tan 50^\circ.\tan 15^\circ=1.$

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42. Evaluate the following expression : $\sin^2.\frac{\pi}{12}+\sin^2.\frac{3\pi}{12}+\sin^2.\frac{5\pi}{12}.$

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

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44. Find the value of: $\log(\tan 1^\circ) + \log(\tan 2^\circ) + \ldots + \log(\tan 89^\circ)$.

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45. If $\sec\theta = -13/5$, where $90^\circ < \theta < 180^\circ$, evalute : $\sin 2\theta, \cos 2\theta$ and $\tan 2\theta$.

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46. If $\cos\theta = 3/7$, and θ lies in the fourth quadrant, evaluate : $\sin(\theta/2), \cos(\theta/2), \tan(\theta/2)$.

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47. Show that $\sqrt{2+\sqrt{2+\sqrt{2+2\cos 8\theta}}} = 2\cos\theta$

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48. Prove that : $\frac{1+\sin A-\cos A}{1+\sin A+\cos A}=\tan\left(\frac{A}{2}\right)$.

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49. Show that : $\cos 9^\circ . \cos 18^\circ . \cos 36^\circ . \cos 72^\circ = \frac{\sin 36^\circ}{16\cos 81^\circ}$

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50. Prove that $\cos 20^0 \cos 40^0 \cos 60^0 \cos 80^0 = \frac{1}{16}$.

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51. Show that: $4\cos A.\cos\left(\frac{\pi}{3}-A\right).\cos\left(\frac{\pi}{3}+A\right)=\cos 3A$

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52. $\sin\left(\frac{\pi}{18}\right)\cdot\sin\left(5\frac{\pi}{18}\right)\cdot\sin\left(7\frac{\pi}{18}\right)$

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53. If $\tan\alpha = 3$, calculate : $\dfrac{2\sin 2\alpha - 3\sin 2\alpha}{4\sin 2\alpha + 5\cos 2\alpha}$.

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54. If $p\sin\theta - q\cos\theta = 0$ evalute : $p\cos 2\theta + q\sin 2\theta$.

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55. If $\tan^2\alpha = 2\tan^2\beta + 1$, evaluate : $\cos 2\alpha + \sin^2\beta$.

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56. If $\sin\alpha + \cos\alpha = \dfrac{1}{5}$, find $\tan\left(\dfrac{\alpha}{2}\right)$.

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57. If α and β are two angles in the first quadrant such that $\sin(\alpha+\beta)=1$ and $\sin(\alpha-\beta)=1/2$, find $\tan(\alpha+2\beta)$.

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58. $\cot 15^\circ + \cot 75^\circ + \cot 135^\circ - cosec30^\circ =$

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59. The value of $\cos$ '(2pi)/(15)cos(4pi)/(15)cos(8pi)/(15)$\cos\frac{14\pi}{15}$, is

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60. Evaluate : $\cos ec10^\circ - \sqrt{3}\sec 10^\circ$

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61. Prove that:$\tan 6^0 \tan 42^0 \tan 66^0 \tan 78^0 = 1$.

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62. $\left(1+\cos.\frac{\pi}{8}\right)\left(1+\cos.\frac{3\pi}{8}\right)\left(1+\cos.\frac{5\pi}{8}\right)\left(1+\cos.\frac{7\pi}{8}\right)$ is equal to

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63. If $\sin\theta+\sin\phi=a$ and $\cos\theta+\cos\phi=b$ find $\cos\left(\frac{\theta-\phi}{2}\right)$ in terms of a and b.

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64. If $A+B+C=\pi$, show that : $\tan A+\tan B+\tan C=\tan A.\tan B.\tan C$ Hence. Deduce the value of : $\cot A.\cot B+\cot B.\tan C+\cot C.\cot A$

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65. If $A+B+C=\pi$, show that : $\tan.\frac{A}{2}\tan.\frac{B}{2}+\tan.\frac{B}{2}\tan.\frac{C}{2}+\tan.\frac{C}{2}\tan.\frac{A}{2}=1$ Hence deduce that : $\cot.\frac{A}{2}+\cot.\frac{B}{2}+.\cot.\frac{C}{2}=\cot.\frac{A}{2}.\cot.\frac{B}{2}\tan.\frac{C}{2}.$

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66. If $A+B+C=\pi$ then $\sin 2A+\sin 2B+\sin 2C=$

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67. If $A+B+C=\pi$, prove that : $\cos 2A+\cos 2B-\cos 2C=1-4\sin A\sin B\cos C$

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

$(\cot B+\cot C)(\cot C+\cot A)(\cot A+\cot B)=\cos ecA\cos ecB\cos ecC$

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69. If $p=\tan 20^\circ$ express $\frac{\tan 160^\circ-\tan 110^\circ}{1+\tan 160^\circ.\tan 110^\circ}$ in terms of p.

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70. If $\cos\theta=\frac{1}{2}\left(a+\frac{1}{a}\right)$, show that : $\cos 3\theta=\frac{1}{2}\left(a^3+\frac{1}{a^3}\right)$

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71. If $\sin\theta$ and $\cos\theta$ are the roots of the equation $ax^2-bx+c=0$, show that : $a^2+2ac-b^2=0$.

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72. If $P_n = \cos^n \theta + \sin^n \theta$, show that : $2P_6 - 3P_4 + 1 = 0$.

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73. Evaluate : $\sin 163^\circ . \cos 347^\circ + \sin 73^\circ . \sin 167^\circ$.

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

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75. If $\sin x + \sin^2 x = 1$. then evaluate : (i) $\cos^8 x + 2\cos^6 x + \cos^4 x$

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76. If $\sin x + \sin^2 x = 1$, then find the value of $\cos^{12} x + 3\cos^{10} x + 3\cos^8 x + \cos^6 x - 1$

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77. If $p\sin\theta + q\cos\theta = a$ and $p\cos\theta - q\sin\theta = b$, show that : $\frac{p+a}{q+b} + \frac{q-b}{p-a} = 0.$

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78. If $\cos\theta = \frac{a\cos\phi + b}{a + b\cos\phi}$. Show that : $\tan.\frac{\theta}{2} = \pm\sqrt{\frac{a-b}{a+b}}\tan.\frac{\phi}{2}$.

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79. Prove that: $\frac{\sin x}{\cos 3x} + \frac{\sin 3x}{\cos 9x} + \frac{\sin 9x}{\cos 27x} = (\tan 27x - \tan x)$

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80. Let AandB be acute angles such that $\sin A = \sin^2 B$ and $2\cos^2 A = 3\cos^2 B$. Then A equal to

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81. If $\sin\theta_1 + \sin\theta_2 + \sin\theta_3 = 3$, evaluate : $\cos\theta_1 + \cos\theta_2 + \cos\theta_3$.

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82. If x and y are real numbers such that $\sin^2\theta = \frac{x^2+y^2}{2xy}$ show that $x = y$.

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Mcqs

1. If $\tan A = \frac{\sqrt{3}-1}{\sqrt{3}+1}$, then: $\cos A =$

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

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

C. $\left(\sqrt{3}+1\right)$

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

Answer: B

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2. If $\tan\theta = \frac{1}{\sqrt{7}}$,then $\frac{cosec^2\theta - \sec^2\theta}{cosec^2\theta + \sec^2\theta} = ?$

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

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

C. $\frac{5}{6}$

D. $\frac{7}{8}$

Answer: B

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3. If : $\tan\theta = \frac{1}{7}$, then: $\frac{2\sin\theta + 3\cos\theta}{3\sin\theta + 4\cos\theta} =$

A. $\frac{32}{13}$

B. $\frac{23}{13}$

C. $\frac{23}{31}$

D. $\frac{13}{23}$

Answer: C

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4. If : $\tan\theta + \cot\theta = 2$, then: $\sin\theta + \cos\theta$

A. $(\sqrt{5})$

B. 2

C. $(\sqrt{3})$

D. $(\sqrt{2})$

Answer: D

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5. If : $2\cos A \cdot \tan B - 2\cos A - \tan B + 1 = 0,$ then they measures of angles A and B are respectively

A. $(60^\circ, 45^\circ)$

B. $(30^\circ, 45^\circ)$

C. $(45^\circ, 75^\circ)$

D. $(45^\circ, 60^\circ)$

Answer: A

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6. If : $\sin(A-B)=\cos(A+B)=\frac{1}{2}$, then: (A, B)

A. $(15^\circ, 45^\circ)$

B. $(15^\circ, 30^\circ)$

C. $(45^\circ, 15^\circ)$

D. $(90^\circ, 0^\circ)$

Answer: C

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7. If : $\tan(A+B)=\sqrt{3}$ and $\csc(A-B)=2$then: $(A, B)=$

A. $(30^\circ, 60^\circ)$

B. $(45^\circ, 15^\circ)$

C. $(15^\circ, 45^\circ)$

D. $(60^\circ, 30^\circ)$

Answer: B

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

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9. If : $\frac{1+\sin\theta}{1+\cos\theta}+\frac{1-\sin\theta}{1-\cos\theta}=2u.\ (\csc\theta-\cos\theta),\ \text{then}: u=$

A. $\sin\theta$

B. $\cos\theta$

C. $\sec\theta$

D. $\csc\theta$

Answer: D

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10. $\dfrac{\cos\theta \cdot \csc\theta - \sin\theta \cdot \sec\theta}{\cos\theta + \sin\theta}$

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

B. $\cos\theta + \cot\theta$

C. $\sec\theta + \csc\theta$

D. $\csc\theta - \sec\theta$

Answer: D

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11. $\dfrac{\sin^2\theta}{1-\cot\theta} + \dfrac{\cos^2\theta}{1-\tan\theta} = 1 + u, \text{then}: u$

A. $\sin\theta \cdot \cos\theta$

B. $\sec\theta \cdot \csc\theta$

C. $\tan\theta \cdot \cot\theta$

D. none of these.

Answer: A

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

A. 0

B. 1

C. 2

D. 3

Answer: C

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13. $(\csc\theta-\sin\theta)(\sec\theta-\cos\theta)(\tan\theta+\cot\theta)=$

A. 0

B. 1

C. 2

D. 3

Answer: B

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14. $(\sec\theta + \tan\theta - 1)(\sec\theta - \tan\theta + 1) =$

A. $2\sin\theta$

B. $2\cos\theta$

C. $2\sec\theta$

D. $2\tan\theta$

Answer: D

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15. If : $f(x) = \sec^2 x$, It br gt then : $(1 + \tan A \cdot \tan B)^2 + (\tan A - \tan B)^2 =$

A. $f(A) + f(B)$

B. $f(A) - f(B)$

C. $f(A) \cdot f(B)$

D. $f(A) / f(B)$

Answer: C

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16. If : $(\sin\theta + \csc\theta)^2 + (\cos\theta + \sec\theta)^2 = \tan^2\theta + \cot^2\theta + k$,

then : k =

A. 1

B. 3

C. 5

D. 7

Answer: D

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17. If : $\sin^4\theta + \cos^4\theta + \sin^2\theta \cdot \cos^2\theta = 1 - u^2$, then : $u =$

A. $\sin\theta \cdot \cos\theta$

B. $\sec\theta \cdot \csc\theta$

C. $\sec\theta \cdot \tan\theta$

D. $\csc\theta \cdot \cot\theta$

Answer: A

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18. If : $(\sin\theta + \cos\theta)(1 - \sin\theta \cdot \cos\theta) = \sin^n\theta + \cos^n\theta$, then : $n =$

A. 0

B. 1

C. 2

D. 3

Answer: D

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19. If : $\sin^6\theta + \cos^6\theta = 1 - 3u^2 + 3u^4$, then : $u =$

A. $\sec\theta$

B. $\tan\theta$

C. $\sin\theta$

D. $\cos\theta$

Answer: C

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20. If $\sin\theta + \sin^2\theta = 1$ then $\cos^2\theta + \cos^4\theta$ is equal to

A. 0

B. 1

C. 2

D. 3

Answer: B

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21. if : $p \cdot \cos\theta = \sqrt{p^2 + q^2}.\sin\theta$, then : $q \cdot \sin\theta =$

A. p

B. $\sqrt{p^2 - q^2}$

C. $\sqrt{p^2 + q^2}.\cos\theta$

D. none of theses

Answer: A

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22. If : $\cos\theta + \sin\theta = 1$, then : $\cos\theta - \sin\theta$

A. 1

B. -1

C. ± 1

D. none of these

Answer: C

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23. If : $\sin\theta = \sqrt{3} \cdot \cos\theta$, then : $2(\sin\theta + \cos\theta) - 1 =$

A. $\sqrt{3}$

B. $\sqrt{2}$

C. $\sqrt{1}$

D. $\sqrt{0}$

Answer: A

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24. If : $\cos\theta - \sin\theta = \sqrt{2}.\sin\theta$, then : $\cos\theta + \sin\theta =$

A. $\sqrt{2} \cdot \csc\theta$

B. $\sqrt{2} \cdot \sec\theta$

C. $\sqrt{2} \cdot \cos\theta$

D. $\sqrt{2} \cdot \tan\theta$

Answer: C

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25. If : $\sin^2\theta + \sin^4\theta = 1$, then : $\tan^4\theta - \tan^2\theta =$

A. -1

B. 0

C. 1

D. 2

Answer: C

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26. If : $\sin^2\theta + \sin^4\theta = 1$, then : $\cot^2\theta + \cot^4\theta =$

A. -1

B. 1

C. 2

D. 4

Answer: B

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27. If : $\sec\theta + \cos\theta = 2 \text{then} : \sec^2\theta - \sec^4\theta =$

A. 1

B. $\cos^2\theta + \cos^4\theta$

C. -1

D. $\cos^4\theta - \cos^2\theta$

Answer: D

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28. If : $\tan\theta + \cot\theta = 2, \text{then} : \tan^2\theta - \tan^3\theta =$

A. $\cot^3\theta - \cot^2\theta$

B. 1

C. $\cot^2\theta + \cot^3\theta$

D. 2

Answer: A

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29. If : $\cos^2\theta - \sin^2\theta = \tan^2\phi$, then : $\cos^2\phi - \sin^2\phi =$

A. $\tan^2\theta$

B. $\sec^2\theta$

C. $\sin^2\theta$

D. $\cos^2\theta$

Answer: A

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30. If : $\cos^2\theta - \sin^2\theta = \tan^2\alpha$ and $\cos\theta \cdot \cos\alpha = \cos\beta$, then: $\beta =$

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

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

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

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

Answer: B

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31. If : $a \cdot \sec\alpha + b \cdot \tan\alpha = m$ and : $a\tan\alpha + b \cdot \sec\alpha = n$, then : $a^2 - b^2 =$

A. $m^2 + n^2$

B. $m^2 - n^2$

C. $m^2 - a^2$

D. $m^2 - b^2$

Answer: B

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32. If : $1 + \sin\alpha \cdot \sin\beta - \cos\alpha \cdot \cos\beta = 0 \quad \text{then} : \tan\alpha \cdot \cot\beta =$

A. -3

B. -2

C. -1

D. 0

Answer: C

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33. If :

$(1-\sin\alpha)(1-\sin\beta)(1-\sin\gamma)=(1+\sin\alpha)(1+\sin\beta)(1+\sin\gamma)$,

then one value of each side is

A. $\cos\alpha\cdot\cos\beta\cdot\cos\gamma$

B. $\sin\alpha\cdot\sin\beta\cdot\sin\gamma$

C. $\sec\alpha\cdot\sec\beta\cdot\sec\gamma$

D. $\tan\alpha\cdot\tan\beta\cdot\tan\gamma$

Answer: A

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34. Given that:

$(1+\cos\alpha)(1+\cos\beta)(1+\cos\gamma)=(1-\cos\alpha)(1-\cos\beta)(1-\cos\gamma)$,

Show that one of the values of each member of this equality is $\sin\alpha\sin\beta\sin\gamma$.

A. $\cos\alpha \cdot \cos\beta \cdot \cos\gamma$

B. $\sin\alpha \cdot \sin\beta \cdot \sin\gamma$

C. $\sec\alpha \cdot \sec\beta \cdot \sec\gamma$

D. $\tan\alpha \cdot \tan\beta \cdot \tan\gamma$

Answer: B

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35. If $(\sec\alpha + \tan\alpha)(\sec\beta + \tan\beta)(\sec\gamma + \tan\gamma) = \tan\alpha\tan\beta\tan\gamma$, then $(\sec\alpha - \tan\alpha)(\sec\beta - \tan\beta)(\sec\gamma - \tan\gamma) =$

A. -3

B. -2

C. 0

D. 1

Answer: D

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36. If :

$(\csc\alpha - \cot\alpha)(\csc\beta - \cot\beta)(\csc\gamma - \cot\gamma) = (\csc\alpha + \cot\alpha)(\csc\beta + \cot$

then the value of each side is

A. 1

B. 2

C. 3

D. none of these

Answer: A

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37. If $\tan\alpha + \cot\alpha = a$, then the value of $\tan^4\alpha + \cot^4\alpha$ is equal to

A. $a^4 + 4a^2 + 2$

B. $a^4 + 4a^2 - 2$

C. $a^4 - 4a^2 + 2$

D. $a^4 - 4a^2 - 2$

Answer: C

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38. If A ,B, C are the angles of a triangle , then :

$$\tan\frac{A}{2} \cdot \tan\frac{B+C}{2} + \cos\frac{A+B}{2} \cdot \csc\frac{C}{2} =$$

A. 1

B. 2

C. 0

D. 3

Answer: B

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39. If $x = r\cos A\cos B, y = r\cos A\sin B, z = r\sin A$ then $x^2 + y^2 + z^2 =$

A. $r^2\left(\sin^2 A + \cos^2 B\right)$

B. $r^2\left(\cos^2 A + \sin^2 B\right)$

C. r^2

D. $2r^2$

Answer: C

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40. If $x = a\cos^2\theta + b\sin^2\theta$ and $(x-a)(b-x) = c^2\cdot\sin^2\theta\cdot\cos^2\theta$ then $c =$

A. a-b

B. $a + b$

C. $a^2 - b^2$

D. $a^2 + b^2$

Answer: A

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41. If $\sin A, \cos A$ and $\tan A$ are in G.P. then find cthe value of $\cot^6 A - \cot^2 A$

A. 1

B. 2

C. 3

D. 4

Answer: A

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42. If $x = \cos(A+B)\cos(A-B)$ and $y = \sin(A+B)\sin(A-B)$ then $x - y =$

A. sin 2A

B. cos 2A

C. sin 2B

D. cos 2B

Answer: B

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43. If $x = \sin\left(\frac{\pi}{3} + A\right) \cdot \cos\left(\frac{\pi}{3} + B\right)$ and $y = \cos\left(\frac{\pi}{3} + A\right) \cdot \sin\left(\frac{\pi}{3} + B\right)$ then $x - y =$

A. $\sin(A-B)$

B. $\cos(A-B)$

C. $\sin(A+B)$

D. $\cos(A+B)$

Answer: A

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44. If $x = \tan\left(\frac{\pi}{4}+A\right)+\tan\left(B-\frac{\pi}{4}\right)$ and $y = \tan\left(\frac{\pi}{4}+A\right)\cdot\tan\left(B-\frac{\pi}{4}\right)$ then $\frac{x}{1-y} =$

A. $\sin(A+B)$

B. $\cos(A+B)$

C. $\tan(A+B)$

D. $\tan(A-B)$

Answer: C

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45. $\sin(A+B)\cdot\sin(A-B)=$

A. $\sin^2 A-\cos^2 B$

B. $\cos^2 A-\sin^2 B$

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

D. $\cos^2 A-\cos^2 B$

Answer: C

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46. $\cos(A+B)\cdot\cos(A-B)=$ (a)$\sin^2 A-\cos^2 B$ (b)$\cos^2 A-\sin^2 B$ (c)$\sin^2 A-\sin^2 B$ (d)$\cos^2 A-\cos^2 B$

A. $\sin^2 A-\cos^2 B$

B. $\cos^2 A-\sin^2 B$

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

D. $\cos^2 A-\cos^2 B$

Answer: B

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47. Prove that $1 + \tan A \tan\left(\frac{A}{2}\right) = \tan A \cot\left(\frac{A}{2}\right) - 1 = \sec A.$

A. sin A

B. cos A

C. csc A

D. sec A

Answer: D

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48. If : $\frac{\tan 3A + \tan A}{\tan 3A - \tan A} = \left(\frac{\sin(mA)}{\sin(nA)}\right)$ then $(m, n) =$ (a) (2,3) (b)(3,4) (c)(4,2) (d) (1,2)

A. (2,3)

B. (3,4)

C. (4,2)

D. (1,2)

Answer: C

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49. If : $x \cdot \cos A \cdot \cos B = \sin(A - B),\ y \cdot \cos B \cdot \cos C = \sin(B - C),$ $z \cdot \cos C \cdot \cos A = \sin(C - A),$ then : x+y+z= (a)-1 (b)0 (c)sin(A+B+C) (d) cos(A-B-C)

A. -1

B. 0

C. sin(A + B + C)

D. cos (A - B - C)

Answer: B

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50. If : $x = \sin(B - C) \cdot \cos A$, $y = \sin(C - A) \cdot \cos B$, $z = \sin(A - B) \cdot \cos C$, then : x+y+z= (a) sin(A-B-C) (b) cos(A-B-C) (c)0 (d)-1

A. sin (A-B-C)

B. cos (A-B-C)

C. 0

D. -1

Answer: C

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51. If :$\cos x \pm \sin x = \sqrt{2} \cdot \cos(x \pm \alpha)$, then: $\alpha =$

A. 30°

B. 45°

C. 60°

D. 90°

Answer: B

Watch Video Solution

52. If $:\cos x \pm \sin x = \sqrt{2} \cdot \cos(x \pm \alpha), \text{then}: \alpha =$ A) 45° B)60° C)90° D)150°

A. 45°

B. 60°

C. 90°

D. 150°

Answer: A

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53. $\tan 20^\circ + \tan 25^\circ + \tan 20^\circ \tan 25^\circ =$

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

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

C. 1

D. $\sqrt{2}$

Answer: C

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54. $\tan 40^\circ + 2 \cdot \tan 10^\circ =$ A)$\tan 30^\circ$ B)$\tan 50^\circ$ C)$\tan 70^\circ$ D)$\tan 90^\circ$

A. $\tan 30^\circ$

B. $\tan 50^\circ$

C. $\tan 70^\circ$

D. $\tan 90^\circ$

Answer: B

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55. If : $\sin\left(x+\frac{\pi}{3}\right)=\cos\left(x-\frac{\pi}{6}\right)$, then : $\tan x=$ A)$1/\sqrt{3}$B)$-1/\sqrt{3}$C)$\sqrt{3}$D)$-\sqrt{3}$

A. $1/\sqrt{3}$

B. $-1/\sqrt{3}$

C. $\sqrt{3}$

D. $-\sqrt{3}$

Answer: A

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56. If : $\sin(\theta - 30^\circ) + \cos(\theta - 60^\circ) = k \cdot \sin\theta$, then: $k =$

A. $1/\sqrt{3}$

B. $-1/\sqrt{3}$

C. $\sqrt{3}$

D. $-\sqrt{3}$

Answer: C

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57. $\cos x + \cos(120^\circ - x) + \cos(120^\circ + x) = 0$

A. -1

B. 0

C. $\sqrt{3}$

D. $1/\sqrt{3}$

Answer: B

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58. $\tan(45^\circ + A)\tan(45^\circ - A) = 1$

A. -1

B. 0

C. 1

D. $\sqrt{2}$

Answer: C

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59. $\tan 75^\circ + \tan 15^\circ =$ A)1B)2C)3D)4

A. 1

B. 2

C. 3

D. 4

Answer: D

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60. $1 + \tan\theta \cdot \tan 2\theta =$ A)$2\csc\theta$B)$\sec 2\theta$C)$2\sec\theta$D)$\csc 2\theta$

A. $2\csc\theta$

B. $\sec 2\theta$

C. $2\sec\theta$

D. $\csc 2\theta$

Answer: B

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61. $\tan 2\theta \cdot \cot \theta - 1 =$ A)$2\csc\theta$B)$\sec 2\theta$C)$2\sec\theta$D)$\csc 2\theta$

A. $2\csc\theta$

B. $\sec 2\theta$

C. $2\sec\theta$

D. $\csc 2\theta$

Answer: B

Watch Video Solution

62. If : $A + B = 90^\circ$, and $\tan A = \frac{3}{4}$ then : $\cot B =$

A. -1

B. 0

C. 3/4

D. $\sqrt{2}$

Answer: C

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63. If : $\sin(\theta+\phi)=2\sin(\theta-\phi)$, then: $\tan\theta=$ A)$\tan\phi$B)$2\tan\phi$C) $3\tan\phi$D)$4\tan\phi$

A. $\tan\phi$

B. 2 tan phi`

C. $3\tan\phi$

D. $4\tan\phi$

Answer: C

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64. If $\sin(x-60^\circ)=2.\cos(x-30^\circ)$, then : $\tan x=$ .... .

A. $-3\sqrt{3}$

B. -3

C. $-\sqrt{3}$

D. $3+\sqrt{3}$

Answer: A

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65. If : $a=\tan x, b=\tan y,$ $c=\sqrt{1+a^2}, d=\sqrt{1+b^2}, \text{then}: cd\cdot\sin(x+y)=$ A)$a-b$B)$a+b$C) $c-d$D)$c+d$

A. a-b

B. a + b

C. c - d

D. c + d

Answer: B

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66. $\cos^2\left(\frac{\pi}{4}-\theta\right)+\cos^2\left(\frac{\pi}{4}+\theta\right)=\ldots\ldots$

A. $\sin 2\theta$

B. $\cos 2\theta$

C. 1

D. 0

Answer: C

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67. $\cot\left(\frac{\pi}{12}\right)+\cot\left(\frac{3\pi}{12}\right)+\cos\left(\frac{9\pi}{12}\right)+\cos\left(\frac{11\pi}{12}\right)$

A. $\cos 2\pi$

B. $\cos \pi$

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

D. $\cos \frac{5\pi}{12}$

Answer: C

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68. $\cot, \frac{\pi}{20}. \cot. \frac{3\pi}{12} + \cot. \frac{7\pi}{20} \cot. \frac{9\pi}{20} = \ldots.$

A. 1

B. 2

C. 3

D. 4

Answer: A

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69. Statement I : $\frac{\sin^2\pi}{8}+\frac{\sin^2(3\pi)}{8}+\frac{\sin^2(5\pi)}{8}+\frac{\sin^2(7\pi)}{8}=2$

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

Statement III: $\frac{\sin^2\pi}{8}+\frac{\sin^{3\pi}}{8}+\frac{\sin^2(5\pi)}{8}\frac{\sin^2(7\pi)}{8}=\frac{3}{2}$

A. 1

B. 2

C. 3

D. 4

Answer: B

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70. If H is the orthocentre of f$\Delta ABC,$ then : $\sin(\angle BHC)=$

A. sin A

B. sin B

C. sin C

D. cos B

Answer: A

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71. If H is the orthocentre of $\Delta ABC,$ then : $\cos(\angle AHB) =$

A. $-\cos A$

B. $-\cos B$

C. $-\cos C$

D. $-\cos D$

Answer: C

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72. $\tan\theta \cdot (1 + \cos 2\theta) =$ A)$2\sin\theta$B)$\sin 2\theta$C)$2\cos\theta$D)$\cos 2\theta$

A. $2\sin\theta$

B. $\sin 2\theta$

C. $2\cos\theta$

D. $\cos 2\theta$

Answer: B

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73. $(1+\sec 2\theta)\cdot\sqrt{\sec^2\theta-1}=$ A)$2\sec\theta$B)$\sec 2\theta$C)$2\tan\theta$D)$\tan 2\theta$

A. $2\sec\theta$

B. $\sec 2\theta$

C. $2\tan\theta$

D. $\tan 2\theta$

Answer: D

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74. $\csc\theta - 2\cos\theta \cdot \cot 2\theta =$ A)$2\sin\theta$B)$\sin 2\theta$C)$2\cos\theta$D)$\cos 2\theta$

A. $2\sin\theta$

B. $\sin 2\theta$

C. $2\cos\theta$

D. $\cos 2\theta$

Answer: A

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75. If : $\frac{1+\sin\theta+\cos\theta}{1+\sin\theta-\cos\theta} = f\left(\frac{\theta}{2}\right)$. then: $f \equiv$ A)sinB)cos C)tanD)cot

A. sin

B. cos

C. tan

D. cot

Answer: D

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76. $\frac{1-\tan^2(45^\circ - A)}{1+\tan^2(45^\circ - A)}$ is equal to

A. sin 2 A

B. cos 2 A

C. tan 2 A

D. cot 2 A

Answer: A

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77. $\frac{\sin 3\theta}{\sin\theta} - \frac{\cos 3\theta}{\cos\theta} =$ A)$\sin 2\theta$B)$\cos 4\theta$C)1D)2

A. $\sin 2\theta$

B. $\cos 4\theta$

C. 1

D. 2

Answer: D

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78. $\frac{\sin 2\theta}{\sin \theta} - \frac{\cos 2\theta}{\cos \theta} =$ A)$\sec\theta$ B)$\tan\theta$ C)1 D)2

A. $\sec \theta$

B. $\tan \theta$

C. 1

D. 2

Answer: A

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79. $\sin 2\theta \cdot (\tan\theta + \cot\theta) =$ A)$\sec\theta$B)$\csc\theta$C)1D)2

A. $\sec\theta$

B. $\csc\theta$

C. 1

D. 2

Answer: D

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80. If $\sqrt{\frac{1-\sin x}{1+\sin x}} = f\left(\frac{\pi}{4} - \frac{x}{2}\right)$ then $f =$

A. sin

B. cos

C. tan

D. cot

Answer: C

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81. $\cot\left(\frac{A}{2}\right) - \tan\left(\frac{A}{2}\right) =$ A)$2\sin A$B)$2\cos A$C)$2\tan A$D)$2\cot A$

A. $2\sin A$

B. $2\cos A$

C. $2\tan A$

D. $2\cot A$

Answer: D

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82. $8\sin\theta \cdot \cos\theta \cdot \cos 2\theta \cdot \cos 4\theta =$ A)$\sin 4\theta$B)$\sin 8\theta$C)$\sin 16\theta$D)$\cos 8\theta$

A. $\sin 4\theta$

B. $\sin 8\theta$

C. $\sin 16\theta$

D. $\cos 8\theta$

Answer: B

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83. $4\sin\theta \cdot \cos^3\theta - 4\cos\theta \cdot \sin^3\theta =$ A)$4\cos\theta$B)$\cos 4\theta$C)$4\sin\theta$D)$\sin 4\theta$

A. $4\cos\theta$

B. $\cos 4\theta$

C. $4\sin\theta$

D. $\sin 4\theta$

Answer: D

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84. $1 - 8\cos^2\theta + 8\cos^4\theta =$

A. $\sin 4\theta$

B. $\cos 4\theta$

C. $\sin^4\theta + \cos^4\theta$

D. $\sin^4\theta - \cos^4\theta$

Answer: B

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85. If

$\cos 3A + \cos 5A + \cos 7A + \cos 15A = 4\cos mA \cdot \cos nA \cdot \cos pA,$

then , the values of $m,\ n,\ p$ are

A. 2,3,4

B. 3,4,5

C. 4,5,6

D. 5,6,7

Answer: C

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86. If : $\sin 40^\circ - \cos 70^\circ = k \cdot \cos 80^\circ$, then : $k =$ A)$\sqrt{1}$B)$\sqrt{2}$C)$\sqrt{3}$D)$\sqrt{4}$

A. $\sqrt{1}$

B. $\sqrt{2}$

C. $\sqrt{3}$

D. $\sqrt{4}$

Answer: C

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87. $\sin 50^\circ - \sin 70^\circ + \sin 10^\circ$ A)-1B)0C)$\sin 5^\circ$ D)$-\sin 5^\circ$

A. -1

B. 0

C. $\sin 5^\circ$

D. $-\sin 5^\circ$

Answer: B

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88. $\cos 20^\circ + \cos 100^\circ + \cos 140^\circ =$ A)$\cos 130^\circ$ B)$\cos 45^\circ$ C)0D)none of these

A. $\cos 130^\circ$

B. $\cos 45^\circ$

C. 0

D. none of these

Answer: C

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89. $\cos 55^\circ + \cos 65^\circ + \cos 175^\circ =$ A)0B)1C)$\sin 18^\circ$ D)$\cos 36^\circ$

A. 0

B. 1

C. $\sin 18^\circ$

D. $\cos 36^\circ$

Answer: A

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90. $\sin 10^\circ + \sin 20^\circ + \sin 40^\circ + \sin 50 =$ A)$\sin 15^\circ + \sin 75^\circ$ B)$\cos 15^\circ + \cos 75^\circ$ C)$\sin 70^\circ + \sin 80^\circ$ D)$\cos 70^\circ + \cos 80^\circ$

A. $\sin 15^\circ + \sin 75^\circ$

B. $\cos 15^\circ + \cos 75^\circ$

C. $\sin 70^\circ + \sin 80^\circ$

D. $\cos 70^\circ + \cos 80^\circ$

Answer: C

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91. $\dfrac{\sin 75^\circ - \sin 15^\circ}{\cos 75^\circ + \cos 15^\circ}$ A) $-\sqrt{3}$ B) $\sqrt{3}$ C) $\dfrac{1}{\sqrt{3}}$ D) $\dfrac{1}{\sqrt{3}}$

A. $-\sqrt{3}$

B. $\sqrt{3}$

C. $-\dfrac{1}{\sqrt{3}}$

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

Answer: D

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92. $\frac{\cos 21^\circ - \sin 21^\circ}{\cos 21^\circ + \sin 21^\circ}$ A)$\tan 21^\circ$ B)$\cot 66^\circ$ C)$\tan 42^\circ$ D)$\cot 42^\circ$

A. $\tan 21^\circ$

B. $\cot 66^\circ$

C. $\tan 42^\circ$

D. $\cot 42^\circ$

Answer: B

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93. $\sin 7\theta \cdot \sin \theta + \sin 11\theta \cdot \sin 3\theta =$ A) $\sin 4\theta \cdot \sin 10\theta$ B) $\cos 4\theta \cdot \cos 10\theta$ C) $\sin 8\theta \cdot \sin 4\theta$D)$\cos 8\theta \cdot \cos 14\theta$

A. $\sin 4\theta \cdot \sin 10\theta$

B. $\cos 4\theta \cdot \cos 10\theta$

C. $\sin 8\theta \cdot \sin 4\theta$

D. $\cos 8\theta \cdot \cos 14\theta$

Answer: A

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94. $16 \cdot \cos \frac{\pi}{12} \cdot \cos \frac{4\pi}{12} \cdot \cos \frac{5\pi}{12} =$ A)$\sqrt{1}$B)$\sqrt{2}$C)$\sqrt{3}$D)$\sqrt{4}$

A. $\sqrt{1}$

B. $\sqrt{2}$

C. $\sqrt{3}$

D. $\sqrt{4}$

Answer: D

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95. If : $A+B+C=\pi$, then: $\sin 2A+\sin 2B-\sin 2C=$ A) $4\sin A\cdot\cos B\cdot\cos C$ B) $4\sin B\cdot\sin C\cdot\cos A$ C) $4\sin C\cdot\cos A\cdot\cos B$ D) $4\sin A\cdot\sin B\cdot\sin C$

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

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

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

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

Answer: C

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96. If $A+B+C=\pi$ then $\sin 2A+\sin 2B+\sin 2C=$

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

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

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

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

Answer: A

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97. If : $A + B + C = \pi$, then: $1 - \cos^2 A - \cos^2 B - \cos^2 C =$ A) $2 \cos A \cdot \cos B \cdot \cos C$ B) $2 \sin A \cdot \cos B \cdot \cos C$ C) $2 \cos A \cdot \sin B \cdot \cos C$ D) $2 \cos A \cdot \cos B \cdot \sin C$

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

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

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

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

Answer: A

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98. If : $A+B+C=\pi$, then $\sin^2 A+\sin^2 B-\sin^2 C=$ A) $2\cos A\cdot\cos B\cdot\sin C$ B) $2\cos B\cdot\cos C\cdot\sin A$ C) $2\sin A\cdot\sin B\cdot\cos C$ D) $2\sin B\cdot\sin C\cdot\cos A$

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

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

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

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

Answer: C

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99. If : $A+B+C=\pi$ then: $1-\sin^2\frac{A}{2}-\sin^2\frac{B}{2}+\sin^2\frac{C}{2}=$ A) $2\cos\frac{A}{2}\cdot\cos\sin^2\frac{B}{2}+\sin^2\frac{C}{2}$ B) $2\cos\frac{B}{2}\cdot\cos\frac{B}{2}\cdot\sin\frac{C}{2}$ C) $2\cos\frac{C}{2}\cdot\cos\frac{A}{2}\cdot\sin\frac{B}{2}$ D) $2\cos\frac{A}{2}\cdot\cos\frac{B}{2}\cdot\sin\frac{C}{2}$

A. $2\cos\frac{A}{2}\cdot\cos\sin^2\frac{B}{2}+\sin^2\frac{C}{2}$

B. $2\cos\frac{B}{2}\cdot\cos\frac{B}{2}\cdot\sin\frac{C}{2}$

C. $2\cos\frac{C}{2}\cdot\cos\frac{A}{2}\cdot\sin\frac{B}{2}$

D. $2\cos\frac{A}{2}\cdot\cos\frac{B}{2}\cdot\sin\frac{C}{2}$

Answer: D

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100. $(\csc\theta-\sin\theta)(\sec\theta-\cos\theta)(\tan\theta+\cot\theta)=$ A)1 B)0 C)$-$1D) 2

A. 1

B. 0

C. -1

D. 2

Answer: A

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101. $\sin 2A + \sin 2B + \sin 2(A - B) =$ A)$4\sin A \cdot \sin B \cdot \sin(A - B)$ B)$4\sin A \cdot \cos B \cdot \cos(A - B)$ C)$4\cos A \cdot \sin B \cdot \cos(A - B)$ D) $4\cos A \cdot \cos B \cdot \sin(A - B)$

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

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

C. $4\cos A \cdot \sin B \cdot \cos(A - B)$

D. $4\cos A \cdot \cos B \cdot \sin(A - B)$

Answer: B

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102. $4\cos A \cdot \cos B \cdot \sin(A - B)$

A. $4\cos A \cdot \cos B \cdot \cos(A - B)$

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

C. $4\sin A \cdot \cos B \cdot \sin(A - B)$

D. $4\cos A \cdot \sin B \cdot \cos(A - B)$

Answer: A

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103. $\sin^2 A \cdot \tan^2 A + \cos^2 A \cdot \cot^2 A =$ A)$1 + \tan^2 A + \cot^2 A$ B) $\tan^2 A + \cot^2 A - 1$ C)$1 + \sec^2 A + \tan^2 A$ D)$1 + \csc^2 A + \cot^2 A$

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

B. $\tan^2 A + \cot^2 A - 1$

C. $1 + \sec^2 A + \tan^2 A$

D. $1 + \csc^2 A + \cot^2 A$

Answer: B

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104. $\sqrt{\tan^4 A + \cot^4 A + 2} =$ A)$1 + \sec^2 A + \csc^2 A$ B)$\sec^2 A + \csc^2 A + 2$C)$\sec^2 A + \csc^2 A - 2$ D)$3 - \sec^2 A \cdot \csc^2 A$

A. $1 + \sec^2 A + \csc^2 A$

B. $\sec^2 A + \csc^2 A + 2$

C. $\sec^2 A + \csc^2 A - 2$

D. $3 - \sec^2 A \cdot \csc^2 A$

Answer: C

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105. If :

$\sec\theta \cdot \tan\theta(\sec\theta + \tan\theta) + (\sec\theta - \tan\theta) = \sec^n\theta + \tan^n\theta, \text{then}: n =$

A)1 B)2 C)3 D)4

A. 1

B. 2

C. 3

D. 4

Answer: C

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106. If : $4\left(\sin 3\theta \cdot \cos^3 \theta \cdot 3\theta \cdot \sin^3 \theta\right) = m \cdot \sin(n\theta)$, then: $(m, n) \equiv$

A. (1,2)

B. (2,3)

C. (3,4)

D. (4,5)

Answer: C

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107. If : $\tan\left(\frac{\pi}{4}+\theta\right)-\tan\left(\frac{\pi}{4}-\theta\right)=m\cdot\tan(n\theta)$, then A)$m<n$ B)m = n] C)$m>n$ D)$m^n<n$

A. $m<n$

B. m = n]

C. $m>n$

D. $m^n<n$

Answer: B

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108. If $\tan(\pi\cos\theta)=\cot(\pi\sin\theta)$ then the value of (s) of $\cos\left(\theta-\frac{\pi}{4}\right)$ is(are)

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

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

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

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

Answer: D

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109. If : $\sin A + \cos A = 1$, then : $\sin A - \cos A =$ A) ± 1 B) 0 C) ± 2 D) ± 3

A. ± 1

B. 0

C. ± 2

D. ± 3

Answer: A

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110. If : $\sin^2\left(\frac{\pi}{4}+\frac{\theta}{2}\right)-\cos^2\left(\frac{\pi}{4}+\frac{\theta}{2}\right)=$ A)$\sin\theta$ B)$\cos\theta$ C)$\sin 2\theta$ D)$\cos 2\theta$

A. $\sin\theta$

B. $\cos\theta$

C. $\sin 2\theta$

D. $\cos 2\theta$

Answer: A

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111. If : $\cot\theta=\frac{a}{b}$, then: $a\cdot\cos 2\theta+b\cdot\sin 2\theta=$ A)a^2+b^2 B)a^2-b^2 C)a D)b

A. a^2+b^2

B. a^2-b^2

C. a

D. b

Answer: C

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112. If : $\sin x + \cos x = \sin 2x + \cos 2x$, where$0 < x \leq \frac{\pi}{2}$, then x :=

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

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

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

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

Answer: D

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113. If $\cos ec\theta + \cot\theta = \frac{11}{2}$, then $tan\theta =$

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

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

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

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

Answer: C

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114. $\cos(540^\circ - \theta) - \sin(630^\circ - \theta)$ is equal to

A. 0

B. $2\cos\theta$

C. $2\sin\theta$

D. $\sin\theta + \cos\theta$

Answer: A

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115. If : $x = \tan 25^\circ$, then: $\frac{\tan 155^\circ - \tan 115^\circ}{1 + \tan 155^\circ \cdot \tan 115^\circ} =$ A) $\frac{1 - x^2}{2x}$ B) $\frac{1 + x^2}{2x}$ C) $\frac{1 + x^2}{1 - x^2}$ D) $\frac{1 - x^2}{1 + x^2}$

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

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

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

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

Answer: A

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116. If `sin(120^0-alpha)=sin(120^0-beta),0

A. $\alpha + \beta = \frac{\pi}{3}$

B. $\alpha = \beta$ or $\alpha + \beta = \frac{\pi}{3}$

C. $\alpha = \beta$

D. $\alpha + \beta = 0$

Answer: B

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117. If : $3\sin 2\theta = 5 + 4\cos 2\theta$, then : $\tan\theta =$ A)1 B)3 C)4 D)5

A. 1

B. 3

C. 4

D. 5

Answer: D

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118. $\frac{\cos 3\theta}{\cos^3\theta} + \frac{\sin 3\theta}{\sin^3\theta} =$

A. $3\cos ec2\theta \cdot \cos 2\theta$

B. $3\cos ec2\theta \cdot \cot 2\theta$

C. $12\cos ec2\theta \cdot \cot 2\theta$

D. none of these

Answer: C

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119. $\frac{\tan^2(2\theta) - \tan^2\theta}{1 - \tan^2(2\theta)\tan^2\theta}$ is equal to-

A. $\tan\theta \cdot \tan 2\theta$

B. $\tan\theta \cdot \tan 3\theta$

C. $\tan 2\theta \cdot \tan 3\theta$

D. $\tan\theta \cdot \tan 4\theta$

Answer: B

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120. If : $p = \cot 20^\circ$, then: $\frac{\tan 160^\circ - \tan 110^\circ}{1 + \tan 160^\circ \cdot \tan 110^\circ} =$ A) $\frac{p^2 - 1}{2p}$ B) $\frac{p^2 + 1}{2p}$ C) $\frac{1 - p^2}{2p}$ D) $\frac{2p}{1 + p^2}$

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

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

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

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

Answer: A

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121. If A, B, C, D are angles of a cyclic quadrilateral, then prove that $\cos A + \cos B + \cos C + \cos D = 0$

A. $2(\cos A + \cos C)$

B. $2(\cos A + \cos B)$

C. $2(\cos A + \cos D)$

D. 0'

Answer: D

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122. If $\frac{\sin(x+y)}{\sin(x-y)} = \frac{a+b}{a-b}$, then show that $\frac{\tan x}{\tan y} = \frac{a}{b}$.

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

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

C. ab

D. none of these.

Answer: B

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123. If `pi

A. $2\csc\alpha$

B. $-2\csc\alpha$

C. $\csc\alpha$

D. $-\csc\alpha$

Answer: B

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124. If $\cot(\alpha+\beta)=0$, then $\sin(\alpha+2\beta)$ is equal to

A. $-\sin\alpha$

B. $\sin\beta$

C. $\cos\alpha$

D. $\cos\alpha$

Answer: D

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125. If : $\csc\theta - \cot\theta = p$, then: $\csc\theta =$ A)$\theta + \frac{1}{p}$ B)$\theta - \frac{1}{p}$ C)$\frac{1}{2}\left(p + \frac{1}{p}\right)$ D)$\frac{1}{2}\left(p - \frac{1}{p}\right)$

A. $\theta + \frac{1}{p}$

B. $\theta - \frac{1}{p}$

C. $\frac{1}{2}\left(p + \frac{1}{p}\right)$

D. $\frac{1}{2}\left(p - \frac{1}{p}\right)$

Answer: C

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126. If : $\cos\theta_1 = 2 \cdot \cos\theta_2,$ ltbr gt then$\left(\tan\frac{\theta_1 - \theta_2}{2}\right)\left(\tan\frac{\theta_1 + \theta_2}{2}\right) =$ A)$\frac{1}{3}$ B)$-\frac{1}{3}$ C)1 D)-1

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

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

C. 1

D. -1

Answer: B

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127. If $y = (1 + tanA)(1 - tanB)$, where $A - B = \frac{\pi}{4}$, then $(y + 1)^{y-1}$ is equal to 9 (b) 4 (c) 27 (d) 81

A. 9

B. 4

C. 27

D. 81

Answer: C

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128. If : $\cos^2 A + \cos^2 B + \cos^2 C = 1, \text{then}: \Delta ABC$ is A)scalane B)equilateral C)isosceles D)right angled

A. scalane

B. equilateral

C. isosceles

D. right angled

Answer: D

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129. If : $\sec 2\theta = p + \tan 2\theta, \text{then}: \sin^2 \theta =$ A) $\frac{(p-1)^2}{2(p^2+1)}$ B) $\frac{1}{2}\left(\frac{p-1}{p+1}\right)^2$ C) $\frac{p^2-1}{2(p^2+1)}$ D) $\frac{p^2-1}{2(p+1)^2}$

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

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

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

D. $\frac{p^2-1}{2(p+1)^2}$

Answer: A

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130. If : $\sin\theta = \frac{a^2-b^2}{a^2+b^2}$, then: $\cot\theta =$ A) $\frac{4a^2b^2}{a^2-b^2}$ B) $\frac{a^2+b^2}{a^2-b^2}$ C) $\frac{4a^2b^2}{a^2+b^2}$ D)none of these.

A. $\frac{4a^2b^2}{a^2-b^2}$

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

C. $\frac{4a^2b^2}{a^2+b^2}$

D. none of these.

Answer: D

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131. If : $\cot\theta = \dfrac{2x(x+1)}{2x+1}$, then: $\cos\theta =$ A) $\dfrac{2x+1}{2x^2+2x+1}$ B) $\dfrac{2x}{2x^2+2x+1}$ C) $\dfrac{2x(x+1)}{2x^2+2x+1}$ D) $\dfrac{x+1}{2x+1}$

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

B. $\dfrac{2x}{2x^2+2x+1}$

C. $\dfrac{2x(x+1)}{2x^2+2x+1}$

D. $\dfrac{x+1}{2x+1}$

Answer: C

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132. If : $2\left(\sin^6\theta + \cos^6\theta\right) + 1 = 3(\sin^n\theta + \cos^n\theta)$, then: $n =$ A)4 B)3 C)2 D)1

A. 4

B. 3

C. 2

D. 1

Answer: A

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133. If : $1 + 4p^2 = 4p \cdot \sec\theta$, then : $\sec\theta + \tan\theta =$ A)$\pm 2p$ B)$\pm \frac{1}{2p}$ C)$(2p)$ D)$2p + \frac{1}{2p}$

A. $\pm 2p$

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

C. $(2p)$

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

Answer: C

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134. If $\sec\theta - \tan\theta = x$ and $\sec\theta + \tan\theta = \frac{1}{x}$ then sinf $\sin\theta$ and $\cos\theta$

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

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

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

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

Answer: D

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135. If : $a\sec^2\theta - b\cdot\tan^2\theta = c$, then $= \sin\theta =$ A) $\sqrt{\frac{a+c}{b+c}}$ B) $\sqrt{\frac{a-c}{b-c}}$ C) $\sqrt{\frac{a-c}{b+c}}$ D) $\sqrt{\frac{a+c}{b-c}}$

A. $\sqrt{\frac{a+c}{b+c}}$

B. $\sqrt{\frac{a-c}{b-c}}$

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

D. $\sqrt{\frac{a+c}{b-c}}$

Answer: B

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136. If : $a \cdot \cos A - b \cdot \sin A = c$, then: $a \cdot \sin A + b \cdot \cos A =$ A) $\sqrt{a^2 + b^2 - c^2}$ B) $\sqrt{a^2 - b^2 + c^2}$ C) $\sqrt{b^2 + c^2 - a^2}$ D) $\sqrt{b^2 + c^2 + a^2}$

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

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

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

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

Answer: A

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137. if $\tan x = \frac{b}{a}$ then $\sqrt{\frac{a+b}{a-b}} + \sqrt{\frac{a-b}{a+b}} =$

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

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

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

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

Answer: B

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138. If A, B, C are in A.P then $\frac{\sin A - \sin C}{\cos C - \cos A} =$

A. tan A

B. cot A

C. tan B

D. cot B

Answer: D

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139. If $\cos\theta = \frac{1}{2}\left(x + \frac{1}{x}\right)$ then $\frac{1}{2}\left(x^2 + \frac{1}{x^2}\right)$=

A. $\sin 2\theta$

B. $\cos 2\theta$

C. $\sec 2\theta$

D. $\tan 2\theta$

Answer: B

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140. If : $\sin(\alpha+\beta) = 1$ and $\sin(\alpha-\beta) = \frac{1}{2}$, then : $\tan(\alpha+2\beta)\cdot\tan(2\alpha+\beta) =$ A)-1 B)0 C)1 D)2

A. -1

B. 0

C. 1

D. 2

Answer: C

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141. If $\cos 25^0 + \sin 25^0 = p$, then $\cos 50^0$ is $\sqrt{2 - p^2}$ (b) $-\sqrt{2 - p^2}$ $p\sqrt{2 - p^2}$ (d) $-p\sqrt{2 - p^2}$

A. $\sqrt{2 - p^2}$

B. $-\sqrt{2 - p^2}$

C. $p \cdot \sqrt{2 - p^2}$

D. $-p \cdot \sqrt{2 - p^2}$

Answer: C

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142. The numerical value of $\frac{4}{3}\cot^2 30^\circ - 2\csc^2 60^\circ - \frac{3}{4}\tan^2 30^\circ =$ A) $11/16$ B)$16/11$ C)$13/12$D)$6/11$

A. $11/16$

B. $16/11$

C. $13/12$

D. $6/11$

Answer: C

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143. The numerical value of $3\csc^2 \frac{\pi}{3} + 4\sin^2 \frac{\pi}{4} =$ A)3 B)4 C)5 D)6

A. 3

B. 4

C. 5

D. 6

Answer: D

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144. $\frac{\tan 60^\circ + \sec 60^\circ - 1}{\tan 60^\circ - \sec 60^\circ + 1}$ A)$\sec 30^\circ + 2\cos 60^\circ$ B)$\csc 30^\circ + 2\sin 60^\circ$ C) $\cot 30^\circ + 2\tan 60^\circ$ D)none of these

A. $\sec 30^\circ + 2\cos 60^\circ$

B. $\csc 30^\circ + 2\sin 60^\circ$

C. $\cot 30^\circ + 2\tan 60^\circ$

D. none of these

Answer: B

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145. If θ is an acute angle such that $4\sin^2\theta - 2(\sqrt{3}+1)\sin\theta + \sqrt{3} = 0,$ then: `theta=

A. 30° or 60°

B. 45° or 90°

C. 0° or 180°

D. none of these

Answer: A

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146. If θ is an acute angle such that $2\sin^2\theta - 2\sqrt{2}\cdot\sin\theta + 1 = 0$, then: $\theta =$ A)30° B)45° C)60° D)90°

A. 30°

B. 45°

C. 60°

D. 90°

Answer: B

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147. If A and B are acute angles such that

$\cot(A+B)=1$ and $\cos ec(A-B)=2$, then: $(A, B) \equiv$

A. $(37.5^\circ, 7.5^\circ)$

B. $(30^\circ, 45^\circ)$

C. $(30.5^\circ, 17.5^\circ)$

D. $(0^\circ, 45^\circ)$

Answer: A

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148. If A and B are acute angles such that $2\cos A \cdot \cot B - 2\cos A - \cot B + 1 = 0$, then: $(A, B) \equiv$ A)$(45^\circ, 60^\circ)$ B)$(60^\circ, 45^\circ)$ C)$(30^\circ, 60^\circ)$ D)$(45^\circ, 30^\circ)$

A. $(45^\circ, 60^\circ)$

B. $(60^\circ, 45^\circ)$

C. $(30^\circ, 60^\circ)$

D. $(45^\circ, 30^\circ)$

Answer: B

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149. Find the acute angle A and B such that

$\sec A \cdot \tan B - \sec A - 2\tan B + 2 = 0.$

A. $(60^\circ, 45^\circ)$

B. $(45^\circ, 30^\circ)$

C. $(30^\circ, 45^\circ)$

D. $(30^\circ, 60^\circ)$

Answer: A

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150. If $\tan^2\theta - 4\sqrt{3}\cdot\tan\theta + 3 = 0$, then: $\tan\theta =$

A. $\sqrt{2}$

B. $1/\sqrt{2}$

C. $1/\sqrt{3}$

D. 2

Answer: C

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151. prove that: $\sin^2 30^\circ + \sin^2 45^\circ + \sin^2 60^\circ = \frac{3}{2}$

A. $2/3$

B. $3/2$

C. 13

D. $3/4$

Answer: B

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152. prove that: $4\cot^2(45^\circ) - \sec^2(60^\circ) + \sin^2(30^\circ) = \frac{1}{8}$

A. $(1/2)$

B. $(1/2)^2$

C. $(1/2)^3$

D. $(1/2)^4$

Answer: C

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153. $\left[\left(1 - \tan^2 30^\circ\right) \div \left(1 + \tan^2 30^\circ\right)\right] - \sin 30^\circ =$ A)-1 B)0 C)1 D)2

A. -1

B. 0

C. 1

D. 2

Answer: B

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154. $2\sin 60^\circ - \cos 180^\circ + (1/3)\sin 270^\circ =$ A)$\sqrt{2} + \frac{3}{2}$ B)$\sqrt{3} + \frac{2}{3}$ C) $\sqrt{2} - \frac{3}{2}$ D)$\sqrt{3} - \frac{2}{3}$

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

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

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

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

Answer: B

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155. If $\cos\theta = -3/5, \text{where} \pi < \theta < (3\pi/2), \text{ then:} \frac{csc\theta + \cot\theta}{\sec\theta - \tan\theta} =$

A)$1/4$ B)$1/5$ C)$1/6$ D)none of these

A. $1/4$

B. $1/5$

C. $1/6$

D. none of these

Answer: C

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156. If $\sin\theta = 3/5, \text{where} (\pi/2) < \theta < \pi, \text{ then:} \frac{\sec\theta - \tan\theta}{\csc\theta + \cot\theta}$ A)$-\frac{3}{2}$ B)$\frac{2}{3}$ C)$\frac{3}{2}$ D)-6

A. $-3/2$

B. $2/3$

C. $3/2$

D. -6

Answer: A

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157. If $\tan\theta = \frac{1}{\sqrt{7}}$,then $\frac{cosec^2\theta - \sec^2\theta}{cosec^2\theta + \sec^2\theta} = ?$

A. $3/4$

B. $2/3$

C. $1/2$

D. 1

Answer: A

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158. If $\sin A = 11/61$, where$0 < A < (\pi/2)$, $then: \dfrac{\sec A + \tan A}{\cot A - \csc A} =$

A)$66/13$ B)$-13/66$ C)$-66/15$ D)$-66/5$

A. $66/13$

B. $-13/66$

C. $-66/15$

D. $-66/5$

Answer: D

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159. If $\tan\theta = -4/5$ and θ is not is the second quadrant, then : csc θ =

A)$-\sqrt{41}/51$ B)$-\sqrt{41}/4$ C)$-51\sqrt{41}$ D)$\sqrt{41}/5$

A. $-\sqrt{41}/51$

B. $-\sqrt{41}/4$

C. $-51\sqrt{41}$

D. $\sqrt{41}/5$

Answer: B

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160. If $\cos\theta = -1/2$ and $\pi < \theta < (3\pi/2)$, then: $4\tan^2\theta - 3\cos ec^2\theta =$ A)5 B)6 C)7 D)8

A. 5

B. 6

C. 7

D. 8

Answer: D

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161. If $\sec\theta = \sqrt{2}, \left(\frac{3\pi}{2}\right) < \theta < 2\pi$ then find the value of $\frac{1+\tan\theta+\cos ec\theta}{1+\cot\theta-\cos ec\theta}$

A. -1

B. 0

C. 1

D. $1+\sqrt{2}$

Answer: A

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162. If $3\tan\alpha = 4$ and $180^\circ < \alpha < 270^\circ$, then: $2\cot\alpha - 5\cos\alpha + \sin\alpha =$ A)3.7 B)4.7 C)5.7 D)6.7

A. 3.7

B. 4.7

C. 5.7

D. 6.7

Answer: A

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163. If $\sin\theta = 4/5, where \pi/2 < \theta < \pi,$

evaluate : $\frac{\sec\theta + \tan\theta}{\cos ec\theta - \cot\theta}$

A. $2/3$

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

C. $-3/4$

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

Answer: B

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164. If $\tan\theta = -3/5$ and θ is not in the second quadrant, find the values of $\sec\theta$ and $\cos ec\theta$.

A. $\sqrt{34}/5$

B. $-\sqrt{34}/5$

C. $\sqrt{43}/5$

D. $-\sqrt{43}/5$

Answer: B

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165. If $x = \sin^2\theta + 3\cos\theta - 2 = 0$, then: $\cos^3\theta + \sec^3\theta =$ A)18 B)9 C)4 D)$1/4$

A. 18

B. 9

C. 4

D. $1/4$

Answer: A

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166. If $x = \sin^2\theta \cdot \cos\theta$ and $y = \sin\theta\cos^2\theta$, then:

A. $\left(x^2y\right)^{2/3} + \left(xy^2\right)^{2/3} = 1$

B. $\left(\frac{x^2}{y}\right)^{2/3} + \left(\frac{y^2}{x}\right)^{2/3} = 1$

C. `x^(2)+y^(2)+x^(2)y^(2)=1'

D. none of these

Answer: B

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167. If $\sin x + \cos x = \sqrt{2} \cdot cosx, \quad then: \cos x - \sin x = ...$A) $\sqrt{2} \cdot \cos x$ B)$\sqrt{2} \cdot \sin x$ C)$\sqrt{2} \cdot (\cos x + \sin x)$ D)none of these

A. $\sqrt{2} \cdot \cos x$

B. $\sqrt{2} \cdot \sin x$

C. $\sqrt{2} \cdot (\cos x + \sin x)$

D. none of these

Answer: B

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168. If $x \sin 45^\circ \cos^2(60^\circ) = \frac{\tan^2(60^\circ) \cos ec 30^\circ}{\sec 45^\circ \cot^2(30^\circ)}$, then x=

A. 2

B. 4

C. 8

D. 16

Answer: D

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169. If $\tan x + \cot x = 4, \text{then}: \tan^4 x + \cot^4 x =$ .....A)110 B)191 C)80 D)194

A. 110

B. 191

C. 80

D. 194

Answer: D

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170. If $3\sin x + 5\cos x = 5$, then: $5\sin x - 3\cos x$.... A)± 2 B)± 3 C)± 4 D)± 5

A. ± 2

B. ± 3

C. ± 4

D. ± 5

Answer: B

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171. If $\tan x = \frac{a}{b}$ then show that $\frac{a\sin x - b\cos x}{a\sin x + b\cos x} = \frac{a^2 - b^2}{a^2 + b^2}$

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

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

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

D. none of these

Answer: C

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172. If $\sin x + \sin^2 x = 1$ then $\cos^2 x + \cos^4 x$

A. -1

B. 0

C. 1

D. 2

Answer: C

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173. For any real θ, $(\csc\theta - \sin\theta)(\sec\theta - \cos\theta)(\tan\theta + \cot\theta) = ...$

A. -1

B. 0

C. 1

D. 3

Answer: C

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174. For any real θ $(\sec\theta + \tan\theta - 1)(\sec\theta - \tan\theta + 1) =$ .....A) 2 B) $2\sec\theta$ C)$2\tan\theta$ D)none of these

A. 2

B. $2\sec\theta$

C. $2\tan\theta$

D. none of these

Answer: C

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175. If $\cos^2\theta - \sin^2\theta = \tan^2\alpha,$ then: $\sqrt{2}\cdot\cos\theta\cdot\cos\alpha = \ldots.$ A) $\sin\theta\cdot\sin\alpha$B)1 C)$\tan^2\theta$ D)none of these

A. $\sin\theta\cdot\sin\alpha$

B. 1

C. $\tan^2\theta$

D. none of these

Answer: B

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176. $\sin 105^\circ + \cos 105^\circ =$

A. $\sin 15^\circ$

B. $\cos 30^\circ$

C. $\sin 45^\circ$

D. $\cos 60^\circ$

Answer: C

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177. $\sin\left(\frac{\pi}{3}+A\right).\cos\left(\frac{\pi}{3}+B\right)-\cos\left(\frac{\pi}{3}+A\right).\sin\left(\frac{\pi}{3}+B\right)=\ldots$

A. $\cos(A-B)$

B. $\sin(A-B)$

C. $\cos(A+B)$

D. none of these

Answer: B

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178. If $0 < A < (\pi/2)$ and $0 < B < (\pi/2)$, then angle $(A - B)$ lies in..... Quadrant.

A. First

B. Second

C. Third

D. Fourth

Answer: D

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179. If $0 < A < (\pi/2)$ and $0 < B < (\pi/2)$, then angle $(A - B)$ lies in..... Quadrant.

A. First

B. Second

C. Third

D. Fourth

Answer: B

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180. If $\sin A = 3/5$ and $\cos B = 9/41$, where A, B are both in the first quadrant, then $\sin(A - B) = \ldots\ldots$

A. $-133/205$

B. $-84/205$

C. $125/205$

D. none of these

Answer: A

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181. If

$\sin\alpha = 15/17, (\pi/2) < \alpha < \pi$ and $\sec\beta = 13/12, (3\pi/2) < \beta < 2\pi.$

then $\sin(\alpha - \beta) =$

A. $220/221$

B. $-171/221$

C. $-140/171$

D. none of these

Answer: B

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182. If $\tan\alpha = 3/4, \alpha$ in third quadrant, and $\cos\beta = 9/41, \beta$, in first quadrant, then : $\cos(\alpha + \beta) = ...$

A. $-187/84$

B. $133/205$

C. $124/205$

D. none of these

Answer: B

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183. If $\sin\theta = 1/2, \cos\phi = 12/13,$ where θ lies in the second quadrant and ϕ in the fourth then : $\tan(\theta - \phi) = ...$

A. $\frac{12 + 5\sqrt{3}}{26}$

B. $\frac{\left(12\sqrt{3} + 5\right)}{26}$

C. $\frac{5\sqrt{3} - 12}{12\sqrt{3} + 5}$

D. none of these

Answer: C

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184. For any angles A and B, $\sin(A+B).\sin(A-B) = ...$

A. $\sin\left(A^2 - B^2\right)$

B. $\sin^2 A - \sin^2 B$

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

D. none of these

Answer: B

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185. For any angles A and B, $\cos(A+B).\cos(A-B) = \ldots..$

A. $\cos\left(A^2 - B^2\right)$

B. $\sin^2 A - \sin^2 B$

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

D. none of these

Answer: C

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186. $1 + \tan A . \tan(A/2) = \ldots .$

A. $\sec A$

B. $\tan A$

C. $\cos A$

D. $\cot A$

Answer: A

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187. $\frac{\tan 3A + \tan A}{\tan 3A - \tan A} = . .$

A. $\tan 2A$

B. $\tan 4A$

C. $(\tan 4A)/(\tan 2A)$

D. $(\sin 4A)/(\sin 2A)$

Answer: D

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188. For any angles A,B,C. $\frac{\sin(A-B)}{\cos A.\cos B}+\frac{\sin(B-C)}{\cos B.\cos C}+\frac{\sin(C-A)}{\cos C.\cos A}=\ldots$

A. 0

B. $\sin(A-B-C)$

C. $\tan(A-B-C)$

D. none of these

Answer: A

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189. $\sin x + \cos x = \sqrt{2}.\ \sin(\ldots.\ )$

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

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

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

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

Answer: C

Watch Video Solution

190. $\cos x - \sin x = \sqrt{2}.\ \cos(\ldots.\ )$

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

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

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

D. none of these

Answer: C

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191. $\tan 20^\circ + \tan 25^\circ + \tan 20^\circ . \tan 25^\circ = ...$

A. $-\sqrt{2}$

B. 1

C. $1/\sqrt{2}$

D. -1

Answer: B

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192. $\tan 40^\circ + 2\tan 10^\circ$ is equal to

A. $\tan 20^\circ$

B. $\tan 80^\circ$

C. $\tan 50^\circ$

D. $\tan 30^\circ$

Answer: C

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193. If $A + B = 45^\circ$ then $(1 + \tan A)(1 + \tan B) =$

A. 1

B. 2

C. $\tan A . \tan B$

D. none of these

Answer: B

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194. If $2\sin(x+60^\circ)=\cos(x-30^\circ),$ then : $\tan=\ldots..$

A. $\sqrt{3}$

B. $\sqrt{2}$

C. $-\sqrt{2}$

D. $-\sqrt{3}$

Answer: D

Watch Video Solution

195. $\tan(45^\circ+A)\tan(45^\circ-A)=$

A. -1

B. 0

C. 1

D. $\tan 2A$

Answer: C

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196. $\tan 75^\circ + \tan 15^\circ = \ldots.$

A. $1 + \sqrt{3}$

B. $\sqrt{3} - 1$

C. $\sqrt{3}$

D. 4

Answer: D

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197. If $A + B = 90^\circ$, then : $\tan A . \tan B = \ldots$

A. not defined

B. 1

C. 0

D. none of these

Answer: B

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198. If $\sin(\theta+\phi)=2\sin.(\theta-\phi),$ then : $\tan\theta=K,\tan\phi,$ where K=.....

A. 1

B. 2

C. 3

D. 4

Answer: C

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199. If $\sin\theta = 2\sin(\theta + 2a)$ and $\tan(\theta + \alpha) = K.\tan\alpha$, then : K=....

A. -2

B. -1

C. 2

D. 3

Answer: A

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200. If $\sin(x - 60^\circ) = 2.\cos(x - 30^\circ)$, then : $\tan x = \ldots.$.

A. $\sqrt{3}$

B. $3\sqrt{3}$

C. $-\sqrt{3}$

D. $-3\sqrt{3}$

Answer: D

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201. If $3\tan\theta\tan\phi = 1$ then $\frac{\cos(\theta-\phi)}{\cos(\theta+\phi)}$ is

A. 1

B. 2

C. 3

D. 4

Answer: B

Watch Video Solution

202. If $\theta+\phi=\alpha, \tan\theta = K.\tan\phi$ and $\sin(\theta-\phi) = m.\sin\alpha,$ then :

$m = \ldots\ldots$

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

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

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

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

Answer: B

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

A. 1

B. 2

C. 0

D. 3

Answer: B

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204. $\cos^2\left(\frac{\pi}{4}-\theta\right)+\cos^2\left(\frac{\pi}{4}+\theta\right)=\ldots\ldots$

A. 1

B. 2

C. 3

D. none of these

Answer: A

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205. $\cot\left(\frac{\pi}{20}\right).\cot\left(\frac{3\pi}{20}\right)\cot\left(\frac{5\pi}{20}\right)\cot\left(\frac{7\pi}{20}\right)\cot\left(\frac{9\pi}{20}\right)=\ldots\ldots$

A. -1

B. 0

C. 1

D. none of these

Answer: C

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206. $\cos\left(\frac{\pi}{12}\right) + \sin^2\left(\frac{3\pi}{12}\right) + \sin^2\left(\frac{9\pi}{12}\right) + \cos\left(\frac{11\pi}{12}\right) = \ldots$

A. -1

B. 0

C. 1

D. 2

Answer: B

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207. Statement I : $\frac{\sin^2\pi}{8}+\frac{\sin^2(3\pi)}{8}+\frac{\sin^2(5\pi)}{8}+\frac{\sin^2(7\pi)}{8}=2$

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

Statement III: $\frac{\sin^2\pi}{8}+\frac{\sin^{3\pi}}{8}+\frac{\sin^2(5\pi)}{8}\frac{\sin^2(7\pi)}{8}=\frac{3}{2}$

A. 1

B. 2

C. -1

D. 0

Answer: B

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208. Find the value of $\sin^2 5^\circ+\sin^2 10^\circ+\sin^2 15^\circ+\ldots\ldots\ldots\ldots+\sin^2 90^\circ$.

A. $6\frac{1}{2}$

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

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

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

Answer: D

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209. If $\sec\theta = -13/5,$ where $90^\circ < \theta < 180^\circ,$, then : $\sin\theta = \ldots\ldots$

A. $109/191$

B. $120/199$

C. $-120/169$

D. $-119/169$

Answer: C

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210. If $\cos\theta = 3/7$, and θ lies in the fourth quadrant, evaluate : $\sin(\theta/2), \cos(\theta/2), \tan(\theta/2)$.

A. $\sqrt{(2/7)}$

B. $-\sqrt{(2/5)}$

C. $-\sqrt{(5/7)}$

D. none of these

Answer: C

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211. If $\sqrt{2+\sqrt{2+2\cos 4x}} = K.\cos x$, then : $K = \ldots$.

A. 1

B. 2

C. 3

D. none of these

Answer: B

Watch Video Solution

212. For any angle A, $4\sin A.\ \sin\left(\frac{\pi}{3}-A\right).\ \sin\left(\frac{\pi}{3}+A\right)=\ldots..$

A. $\sin 2A$

B. $\sin 3A$

C. $\sin 4A$

D. none of these

Answer: B

Watch Video Solution

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

A. $1/2$

B. $1/2^2$

C. $1/2^3$

D. $1/2^4$

Answer: D

Watch Video Solution

214. $\tan 20^0 \tan 40^0 \tan 60^0 \tan 80^0$

A. 1

B. 2

C. 3

D. 4

Answer: C

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215. $\frac{1-\tan^2(45^\circ - A)}{1+\tan^2(45^\circ - A)}$ is equal to

A. $\sin 2A$

B. $\cos 2A$

C. $\tan 2A$

D. none of these

Answer: A

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216. If $\frac{\sec 8A - 1}{\sec 4A - 1} = \tan mA.\cot nA,$ then: $(m, n) \equiv ....$

A. (8,4)

B. (4,8)

C. (2,8)

D. (8,2)

Answer: D

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217. If : $\sin(\alpha/2)\cos(\alpha/2) = \frac{12}{25}$. then: $\sin\alpha =$

A. $21/25$

B. $22/25$

C. $23/25$

D. $24/25$

Answer: D

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218. If $\tan\alpha = 3$, calculate : $\frac{2\sin 2\alpha - 3\sin 2\alpha}{4\sin 2\alpha + 5\cos 2\alpha}$.

A. $1/3$

B. $4/9$

C. $-9/4$

D. $-4/9$

Answer: C

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219. If $\sin\alpha + \cos\alpha = \frac{1}{5}$, find $\tan\left(\frac{\alpha}{2}\right)$.

A. $1 \text{ or } (-1/2)$

B. $2 \text{ or } (-1/3)$

C. $3 \text{ or } (-1/4)$

D. none of these

Answer: B

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220. If α and β are two angles in the first quadrant such that $\sin(\alpha+\beta)=1$ and $\sin(\alpha-\beta)=1/2$, find $\tan(\alpha+2\beta)$.

A. $-\sqrt{2}$

B. $\sqrt{2}$

C. $-\sqrt{3}$

D. $\sqrt{3}$

Answer: C

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221. $\sqrt{3}\,\text{cosec}\,20^0-\sec 20^0$

A. 1

B. 2

C. 3

D. 4

Answer: D

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222. The value of $\tan 6^0 \tan 42^0 \tan 66^0 \tan 78^0$ is 1 (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{1}{8}$

A. 1

B. 2

C. 3

D. 4

Answer: A

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223. Statement I : $\frac{\sin^2 \pi}{8} + \frac{\sin^2(3\pi)}{8} + \frac{\sin^2(5\pi)}{8} + \frac{\sin^2(7\pi)}{8} = 2$

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

Statement III: $\frac{\sin^2 \pi}{8} + \frac{\sin^{3\pi}}{8} + \frac{\sin^2(5\pi)}{8} \frac{\sin^2(7\pi)}{8} = \frac{3}{2}$

A. 1

B. 2

C. 3

D. 4

Answer: B

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224. For any angle θ. $\frac{\sin 2\theta + \sin 4\theta + \sin 6\theta + \sin 8\theta}{\cos 2\theta + \cos 4\theta + \cos 6\theta + \cos 8\theta} = \ldots.$ (a) $\tan\theta$ (b) $\tan 3\theta$ (c) $\tan 5\theta$ (d) none of these

A. $\tan\theta$

B. $\tan 3\theta$

C. $\tan 5\theta$

D. none of these

Answer: C

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225. cos40+cos80+cos160 +cos 240

A. -2

B. $-1/2$

C. $-\sqrt{3}$

D. $1/\sqrt{3}$

Answer: B

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

A. $\sqrt{2}$

B. $1/\sqrt{2}$

C. $\sqrt{3}$

D. $1/\sqrt{3}$

Answer: C

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227. If $3\sin\alpha = 5\sin\beta$, then $\dfrac{\tan\left(\frac{\alpha+\beta}{2}\right)}{\tan\left(\frac{\alpha-\beta}{2}\right)}$=

A. 1

B. 2

C. 3

D. 4

Answer: D

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228. The value of $\cos 52^\circ + \cos 68^\circ + \cos 172^\circ$ is

A. -1

B. 0

C. 1

D. none of these

Answer: B

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229. For any angle θ, $\cos\theta + \cos(120^\circ + \theta) + \cos(120^\circ - \theta) = \ldots\ldots .$

A. -1

B. 0

C. 1

D. $\sqrt{3}/2$

Answer: B

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230. $\cos^2\theta + \cos^2(120^\circ + \theta) + \cos^2(120^\circ - \theta) = \ldots\ldots$

A. $2/3$

B. $3/2$

C. $4/5$

D. $5/4$

Answer: B

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231. If $\dfrac{\sin 8\theta.\cos\theta - \sin 6\theta.\cos 3\theta}{\cos 2\theta.\cos\theta - \sin 3\theta.\sin 4\theta} = \tan(K\theta)$, then: $K = \ldots$

A. 1

B. 2

C. 3

D. none of these

Answer: B

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

A. 1

B. $\sqrt{2}$

C. $\sqrt{3}$

D. none of these

Answer: A

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233. If A, B, C are the angles of a triangle such that $\tan A = 1$ and $\tan B = 2$, then : $\tan C = \ldots\ldots\ldots$

A. $\sqrt{3}$

B. $1/\sqrt{3}$

C. 3

D. none of these

Answer: C

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234. If α is any real nubmer then: $\frac{\sin^4\alpha + \sin^2\alpha.\cos^2\alpha + \cos^2\alpha}{\cos^4\alpha + \sin^2\alpha.\cos^2\alpha + \sin^2\alpha} = \ldots.$

(a) 1 (b)2 (c) 3 (d) none of these

A. 1

B. 2

C. 3

D. none of these

Answer: A

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235. If α is any real number, then : $(\sin\alpha + \cos ec\alpha)^2 + (\cos\alpha + \sec\alpha)^2 - \left(\tan^2\alpha + \cot^2\alpha\right) = ...$

A. 3

B. -5

C. 7

D. $2\sin^2\alpha + 3\cos^2\alpha$

Answer: C

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236. If $P_n = \cos^n \theta + \sin^n \theta,$ show that : $2P_6 - 3P_4 + 1 = 0.$

A. -1

B. 0

C. 1

D. none of these

Answer: C

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237. Evaluate : $\sin 163^\circ . \cos 347^\circ + \sin 73^\circ . \sin 167^\circ .$

A. $\sqrt{2}$

B. $1/2$

C. $\sqrt{3}$

D. $1/3$

Answer: B

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

A. 1

B. $1/2$

C. $3/2$

D. 2

Answer: C

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239. $\frac{1}{\cos 290^\circ}+\frac{1}{\sqrt{3}\sin 250^\circ}=$

A. $1/\sqrt{2}$

B. $3/\sqrt{2}$

C. $4/\sqrt{3}$

D. none of these

Answer: C

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240. If $\tan(\pi.\cos\theta) = \cot(\pi.\sin\theta)$, then: $\cos\left(\frac{\pi}{4} - \theta\right) = \ldots.$ (a) $\frac{1}{2}$ (b) $\frac{1}{\sqrt{2}}$ (c) $\frac{1}{2\sqrt{2}}$ (d) $\frac{\sqrt{2}}{2}$

A. $1/2$

B. $1/\sqrt{2}$

C. $1/(2\sqrt{2})$

D. $\sqrt{2}/2$

Answer: C

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241. $\frac{\sin^2 A - \sin^2 B}{\sin A.\cos A - \sin B.\cos B} = ...$

A. $\sin(A - B)$

B. $\cos(A + B)$

C. $\tan(A + B)$

D. none of these

Answer: C

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242. If $x^0 = \left(\frac{13\pi}{6}\right)^c$, then: $x =$ (a) 300° (b) 930° (c) 309° (d) 390°

A. 300°

B. 930°

C. 309°

D. 390°

Answer: D

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243. If $y^c = 27^\circ$, then: $y =$ (a) $\left(\frac{20\pi}{3}\right)^c$ (b) $\left(\frac{20\pi}{3}\right)$ (c) $\left(\frac{3\pi}{20}\right)$ (d) $\frac{\pi}{20}$

A. $\left(\frac{20\pi}{3}\right)^c$

B. $\frac{20\pi}{3}$

C. $\frac{3\pi}{20}$

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

Answer: C

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244. The value of $\cot 5^\circ \cdot \cot 15^\circ \cdot \cot 25^\circ \cdot \cot 35^\circ \cdot \cot 45^\circ \cdot \cot 55^\circ \cdot \cot 65^\circ \cdot \cot 75^\circ \cdot \cot$ is _____

A. 1

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

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

D. 0

Answer: A

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245. Find the value of $\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \ldots\ldots\ldots\ldots + \sin^2 90^\circ$.

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

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

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

D. 8

Answer: C

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246. 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: A

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247. If $\cos ec\theta + \cot\theta = \frac{11}{2}$, then $tan\theta =$

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

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

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

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

Answer: C

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248. If $\tan\theta = \frac{-1}{\sqrt{5}}$ and θ lies in the fourth quadrant, then: $\cos\theta =$

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

B. $\frac{2}{\sqrt{6}}$

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

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

Answer: A

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249. If $\sin x + \sin^2 x = 1$. then evaluate $\cos^8 x + 2\cos^6 x + \cos^4 x$

A. 0

B. -1

C. 2

D. 1

Answer: D

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250. The value of $\cos 1^\circ \cos 2^\circ \cos 3^\circ \ldots \cos 179^\circ$ is

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

B. 0

C. 1

D. none of these

Answer: B

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251. If $\tan A = \frac{1}{2}$ and $\tan B = \frac{1}{3}$, then: $A + B =$ (a) $\frac{\pi}{4}$ (b) 0 (c) π (d) $\frac{\pi}{6}$

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

B. 0

C. π

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

Answer: A

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252. The $\sin\theta + \cos ec\theta = 2,$ then: $\sin^2\theta + \cos ec^2\theta =$

A. 1

B. 4

C. 2

D. 8

Answer: C

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253. $8\sin.\ \frac{x}{8}.\cos.\ \frac{x}{2}.\cos.\ \frac{x}{4}.\cos.\ \frac{x}{8} =$

A. $8\cos x$

B. $\cos x$

C. $8\sin x$

D. $\sin x$

Answer: D

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254. If $\tan\theta + \sec\theta = \sqrt{3},$ then: $\theta =$

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

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

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

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

Answer: C

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255. If $\sin A + \sin B + \sin C = 3$. Then: $\cos A + \cos B + \cos C =$ (a) 0

(b) 1 (c) 2 (d) 3

A. 0

B. 1

C. 2

D. 3

Answer: A

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256. Let `0

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

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

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

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

Answer: B

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257. If, in a ΔABC, $\tan A = 1$ and $\tan B = 2$, then: $\tan C =$ (a) 1 (b) 2 (c) 3 (d) 4

A. 1

B. 2

C. 3

D. 4

Answer: C

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258. If, in a ΔABC, $\tan A = 1$ and $\tan B = 2$, then: $\tan C =$

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

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

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

D. $x - y$

Answer: B

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259. The value of $\sin^2 75^0 - \sin^2 15^0$ is $1/2$ b. $\sqrt{3}/2$ c. 1 d. 0

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

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

C. 1

D. 0

Answer: B

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260. If ΔABC is a right-angled at A, then: $\cos^2 B + \cos^2 C =$

A. -2

B. -1

C. 1

D. 0

Answer: C

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261. $\sin^6 A + \cos^6 A + 3\sin^2 A.\cos^2 A =$

A. 0

B. 1

C. 2

D. 3

Answer: B

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262. If $\cos(A-B)=\frac{3}{5}$ and $\tan A \tan B=2$, then

A. $\cos A.\cos B=\frac{1}{5}$

B. $\cos A.\cos B=-\frac{1}{5}$

C. $\sin A.\sin B=-\frac{6}{5}$

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

Answer: C

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263. If A, B, C, D be the angles of acyclic quadrilateral, show that : $\cos A+\cos B+\cos C+\cos D=0$.

A. 4

B. -2

C. 1

D. 0

Answer: D

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264. If $\sin. \frac{\alpha}{2} + \cos. \frac{\alpha}{2} = 1.4,$ then: $\sin \alpha =$

A. $\frac{50}{47}$

B. $\frac{47}{50}$

C. $\frac{24}{25}$

D. $\frac{25}{24}$

Answer: C

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265. If $\tan \alpha + \cot \alpha = m$ then value of $\tan^4 \alpha + \cot^4 \alpha$ is

A. $m^4 - 4m^2 + 2$

B. $m^4 + 4m^2 - 2$

C. $m^4 - 4m^2 - 2$

D. $m^4 + 4m^2 + 2$

Answer: A

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266. If $\cos\theta + \cos\phi = a$ and $\sin\theta - \sin\phi = b$, then: $2\cos(\theta + \phi)$=

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

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

C. $a^2 + b^2 + 2$

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

Answer: D

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267. If $\sin x + \cos ecx = 2$, then, for all $n \in N$, the value of: $\sin^n x + \cos ec^n x =$ (a) 2 (b) 2^n (c) 2^{n-1} (d) 2^{n-2}

A. 2

B. 2^n

C. $2^n - 1$

D. $2^n - 2$

Answer: A

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268. If $\sin A + \sin B + \sin C = \frac{3\sqrt{3}}{2}$. then: ΔABC is (a) isosceles (b) right angled (c) equilateral (d) obtuse angled

A. isosceles

B. right-angled

C. equilateral

D. obtuse-angled

Answer: C

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269. In triangle ABC, $\cos^2 A + \cos^2 B - \cos^2 C = 1$, then the triangle is necessarily

A. isosceles

B. right-angled

C. equilateral

D. obtuse-angled

Answer: B

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270. If $\tan x = b/a$, then: $a\cos 2x + b\sin 2x =$

A. a

B. $a - b$

C. $a + b$

D. b

Answer: A

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271. $\dfrac{\sin^2 3A}{\sin^2 A} - \dfrac{\cos^2 3A}{\cos^2 A} =$

A. $\cos 2A$

B. $8\cos 2A$

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

D. $\dfrac{1}{4}\cos 2A$

Answer: B

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272. If $tan\theta_1 tan\theta_2 = k,$ then $\frac{\cos(\theta_1 - \theta_2)}{\cos(\theta_1 + \theta_2)} = \frac{1+k}{1-k}$ b. $\frac{1-k}{1+k}$ c. $\frac{k+1}{k-1}$ d. $\frac{k-1}{k+1}$

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

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

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

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

Answer: A

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273. $\tan 5x . \tan 3x . \tan 2x =$

A. $\tan 5x - \tan 3x - \tan 2x$

B. $\dfrac{\sin 5x - \sin 3x - \sin 2x}{\cos 5x - \cos 3x - \cos 2x}$

C. $\tan 5x + \tan 3x + \tan 2x$

D. 0

Answer: A

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274. If $a + b\tan\theta = \sec\theta$ and $b - a\tan\theta = 2\sec\theta$, then: $a^2 + b^2 =$

A. 4

B. 8

C. 5

D. 6

Answer: C

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275. If $\cos 25^0 + \sin 25^0 = p$, then $\cos 50^0$ is $\sqrt{2-p^2}$ (b) $-\sqrt{2-p^2}$ $p\sqrt{2-p^2}$ (d) $-p\sqrt{2-p^2}$

A. $\sqrt{2-p^2}$

B. $-p\sqrt{2-p^2}$

C. $p\sqrt{2-p^2}$

D. $-\sqrt{2-p^2}$

Answer: C

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276. If $\tan(x+y) = 33$ and $x = \tan^{-1} 3$ then y will be

A. 0.3

B. $\tan^{-1}(1.3)$

C. $\tan^{-1}(0.3)$

D. $\tan^{-1}\left(\frac{1}{18}\right)$

Answer: C

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