MATHS

BOOKS - RD SHARMA MATHS (HINGLISH)

TRIGONOMETRIC FUNCTIONS

Solved Examples And Exercises

1. Find $\frac{\cos(2\pi+\theta)\mathrm{cosec}(2\pi+\theta)\tan(\pi/2+\theta)}{\sec(\pi/2+\theta)\cos\theta\cot(\pi+\theta)}$

A. 0

B. 1

C. -1

D. 2

Answer: B

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2. Find the value of $\frac{\sin(180^0+\theta)\cos(90^0+\theta)tan(270^0-\theta)}{\sin(180^0-\theta)\sin(270^0+\theta)}$

A. 0

B. 1

C. -1

D. None of these

Answer: C

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3. Prove that:

$$\frac{\cos ec(90^0+\theta)+\cot(450^0+\theta)}{\cos ec(90^0-\theta)+tan(180^0-\theta)}+\frac{tan(180^0+\theta)+sec(180^0-\theta)}{tan(360^0+\theta)-sec(-\theta)}$$

=2

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4. Prove that: $\frac{tan(90^0-\theta)sec(180^0-\theta)s\in(-\theta)}{s\in(180^0+\theta)\cot(360^0-\theta)\cos ec(90^0-\theta)}=1$

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5. Prove that:

$$\left\{1+\cot\theta-sec\left(\frac{\pi}{2}+\theta\right)\right\}\left\{1+\cot\theta+sec\left(\frac{\pi}{2}+\theta\right)\right\}=2\cot\theta$$

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6. Prove that: $2\sin^2\left(3\frac{\pi}{4}\right)+2\cos^2\left(\frac{\pi}{4}\right)+2\sec^2\left(\frac{\pi}{3}\right)=10$

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7. Prove that: $\frac{\sin^2\pi}{6}+\frac{\cos^2\pi}{3}-tan^2\frac{\pi}{4}=-\frac{1}{2}$

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8. $\cot^2 \frac{\pi}{6} + \cos ec \frac{5\pi}{6} + 3\tan^2 \frac{\pi}{6}$ equals to

A. 2

B. 4

C. 6

D. 8

Answer: C

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9. Prove that: $2s \in^2 \frac{\pi}{6} + \cos ec^2 \frac{7\pi}{6} \frac{\cos^2 \pi}{3} = \frac{3}{2}$

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10. Find all other trigonometrical ratios if $\sin\theta = -\frac{2\sqrt{6}}{5}$ and θ lies in quadrant III.

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11. Find $\sin\theta + tan\theta$ if $\cos\theta = -\frac{12}{13} and \theta$ lies in the third quadrant.

A. $-\frac{5}{156}$

B. $\frac{5}{156}$

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

D. None of these

Answer: B

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12. If $\frac{\sin A}{\sin B} = p and \frac{\cos A}{\cos B} = q$, find $\tan A and tan B$.

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13. If $10\sin^4\alpha + 15\cos^4\alpha = 6$, find the value of $27\cos ec^6\alpha + 8sec^6\alpha$.

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14. If $a = sec\theta - tan\theta$ and $b = \cos ec\theta + \cot\theta$, then show that $ab + a - b + 1 = 0$.

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15. If $\cot x(1 + \sin x) = 4m$ and $\cot x(1 - \sin x) = 4n$, prove that $\left(m^2 - n^2\right)^2 = mn$.

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16. If $T_n = \sin^n x + \cos^n x$, prove that (i) $2T_6 - 3T_4 + 10 = 0$

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17. Prove that: $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} + \sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \frac{2}{\cos\theta}$, if $0 < \theta < \left(\frac{\pi}{2}\right)$

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18. If $\sec\theta + \tan\theta = p$, obtain the values of $\sec\theta, \tan\theta$ and $\sin\theta$ in terms of p .

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19. 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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20. If $tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n,$ show $m^{2-}n^2 = 4\sqrt{mn}.$

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21. Prove that: $sec^2\theta + \cos ec^2\theta = \cos ec^2\theta.\ \sec^2\theta$.

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22. Given that: $(1+\cos\alpha)(1+\cos\beta)(1+\cos\gamma) = (1-\cos\alpha)(1-\cos\beta)(1-\cos\gamma)\cdot$ Show that one of the values of each member of this equality is $\sin\alpha\sin\beta\sin\gamma\cdot$

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23. Prove that:

$$3(\sin\theta - \cos\theta)^4 + 6(\sin\theta + \cos\theta)^2 + 4\left(\sin^6\theta + \cos^6\theta\right) - 13 = 0.$$

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24. Prove that: $2sec^2\theta - sec^4\theta - 2\cos ec^2\theta + \cos ec^4\theta = \frac{1 - tan^8\theta}{tan^4\theta}$

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25. If A lies in second quadrant and $3\tan A + 4 = 0,$ then the value of $2\cot A - 5\cos A + \sin A$ is equal to $-53/10$ (b) $23/10$ $37/10$ (d) 7/10

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26. Which of the following is correct? $s \in 1^0 > s \in 1$ (b) `s in1^0

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27. If $f(x) = \cos^2 x + sec^2 x, then$ (a) $f(x) < 1$ (b) $f(x) = 1$ (c) $2 < f(x) < 1$ (d) $f(x) \geq 2$

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28. If $\sec\theta = x + \frac{1}{4x}$, then $sec\theta + tan\theta =$ (a) x, $\frac{1}{x}$ (b) $2x$, $\frac{1}{2x}$ (c) $-2x$, $\frac{1}{2x}$ (d) $-\frac{1}{x}$, x

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29. If $sec^2\theta = \frac{4xy}{(x+y)^2}$ is true if and only if $x + y \neq 0$ (b) $x = y, x \neq 0$ (c) $x = y$ (d) $x \neq 0, y \neq 0$

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30. If $\cos ecx + \cot x = \frac{11}{2}$, then $tanx =$ (a) $\frac{21}{22}$ (b) $\frac{15}{16}$ (c) $\frac{44}{117}$ (d) $\frac{117}{44}$

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31. If $\frac{3\pi}{4} < \alpha < \pi$, then $\sqrt{2\cot\alpha + \frac{1}{\sin^2\alpha}}$ is equal to $1 - \cot\alpha$ (b) $1 + \cot\alpha$ (c) $-1 + \cot\alpha$ (d) $-1 - \cot\alpha$

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32. If $x = r\sin\theta\cos\phi, y = r\sin\theta\sin\phi$ and $z = r\cos\theta$, then $x^2 + y^2 + z^2$ is independent of θ, ϕ (b) r, θ (c) r, ϕ (d) r

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33. If $\sin\theta + \cos\theta = 0$ and θ lies in the fourth quadrant, find $\sin\theta$ and $\cos\theta$

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34. Prove that: $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}}+\sqrt{\frac{1+\sin\theta}{1-\sin\theta}}=\frac{2}{\cos\theta}$ and $-\frac{2}{\cos\theta}$, if $0 \leq \theta < \frac{\pi}{2}$, and if $\frac{\pi}{2} < \theta \leq \pi$

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35. Prove that:

$$\cos\left(\frac{3\pi}{2}+x\right)\cos(2\pi+x)\left\{\cot\left(\frac{3\pi}{2}-x\right)+\cot(2\pi+x)\right\}=1$$

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36. Prove that: $\frac{\cos(\pi+x)\cos(-x)}{\sin(\pi-x)\cos\left(\frac{\pi}{2}+x\right)}=\cot^2 x$

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37. If $x=\frac{2\sin\theta}{1+\cos\theta+\sin\theta}$, then prove that $\frac{1-\cos\theta+\sin\theta}{1+\sin\theta}$ is equal to x.

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38. If $\tan x = \frac{b}{a}$, then find the value of $\sqrt{\frac{a+b}{a-b}} + \sqrt{\frac{a-b}{a+b}}$.

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39. Find the values of the following trigonometric ratios:

$(i) \cos ec 390^0$

(ii) $\cot 570^0$

(iii) $\tan 480^0$

(iv) $\cos 270^0$

(v) $\frac{\tan(19\pi)}{3}$

(vi) $\sin\left(\frac{-11\pi}{3}\right)$

(vii) $\frac{\cot(-15\pi)}{4}$

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40. Prove that:

$$\sin(-420^0)(\cos 390^0) + \cos(-660^0)(\sin 330^0) = -1.$$

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41. Prove that:

$$\sec\left(\frac{3\pi}{2} - \theta\right)\sec\left(\theta - \frac{5\pi}{2}\right) + tan\left(\frac{5\pi}{2} + \theta\right)\tan\left(\theta - \frac{3\pi}{2}\right) = -1.$$

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42. Find the value of :

$$\sin^2\left(\frac{\pi}{18}\right) + \sin^2\left(\frac{\pi}{9}\right) + \sin^2\left(\frac{7\pi}{18}\right) + \sin^2\left(\frac{4\pi}{9}\right)$$

A. 0

B. 1

C. 2

D. 3

Answer: B

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43. If any quadrilateral ABCD, prove that $\sin(A+B)+\sin(C+D)=0$ $\cos(A+B)=\cos(C+D)$

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44. Find the value of the expression $3\left\{\sin^4\left(\frac{3\pi}{2}-\theta\right)+\sin^4(3\pi+\theta)\right\}-2\left\{\sin^6\left(\frac{\pi}{2}+\theta\right)+\sin^6(5\pi-\theta)\right\}$

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45. If $tan^2\theta=1-a^2$, prove that $\sec\theta+tan^3\theta\cos ec\theta=\left(2-a^2\right)^{3/2}$. Also, find the values of a for which the above result holds true.

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46. If $a\cos^2\theta + 3a\cos\theta\sin^2\theta = m$ and $a\sin^3\theta + 3a\cos^2\theta\sin\theta = n$, then prove that: $(m+n)^{2/3} + (m-n)^{2/3} = 2a^{2/3}$

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47. If $2tan^2\alpha tan^2\beta tan^2\gamma + tan^2\alpha tan^2\beta + tan^2\beta tan^2\gamma + tan^2\gamma tan^2\alpha = 1$, prove that $sin^2\alpha + sin^2\beta + sin^2\gamma = 1$.

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48. If $m^2 + m'^2 + 2mm'\cos\theta = 1$ and $n^2 + n'^2 + 2nn'\cos\theta = 1$; $(mn + m'n') + (mn' + m'n)\cos\theta = 0$ prove that $m^2 + n^2 = \cos ec^2\theta$

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49. If $\frac{\sin^4\theta}{a}+\frac{\cos^4\theta}{b}=\frac{1}{a+b}$, prove that

$$\frac{\sin^8\theta}{a^3}+\frac{\cos^4\theta}{b^3}=\frac{1}{(a+b)^3}$$

$$\frac{\sin^{4n}\theta}{a^{2n-1}}+\frac{\cos^{4n}\theta}{b^{2n-1}}=\frac{1}{(a+b)^{2n-1}}, n\in N$$

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50. If $\frac{\cos^4\alpha}{\cos^2\beta}+\frac{\sin^4\alpha}{\sin^2\beta}=1$ prove that (i)

$\sin^4\alpha+\sin^4\beta=2\sin^2\alpha\sin^2\beta$ (ii) $\frac{\cos^4\beta}{\cos^2\alpha}+\frac{\sin^4\beta}{\sin^2\alpha}=1$

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51. If x is any non-zero real number, show that $\cos\theta\,'and\,'\sin\theta$ can never equal to $x+\frac{1}{x}$,

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52. If $A = \cos^2\theta + \sin^4\theta$, prove that $\frac{3}{4} \leq A \leq 1$ for all values of θ.

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53. If $\tan\theta + \sec\theta = e^x$ then $\cos\theta$ equals

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54. Prove that: $\sqrt{\frac{1-\cos\theta}{1+\cos\theta}} = \{\cos ec\theta - \cot\theta, \quad \text{if} \quad 0 < \theta < \pi, \text{if}$

$\pi < t < 2\pi$.

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55. If `sec theta=sqrt(2)a n d(3pi)/2`

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56. Prove the following identities:

$\sin^8\theta - \cos^8\theta = \left(\sin^2\theta - \cos^2\theta\right)\left(1 - 2\sin^2\theta\cos^2\theta\right)$

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57. Prove the following identities: $\cot^4\theta + \cot^2\theta = \operatorname{cosec}^4\theta - \operatorname{cosec}^2\theta$

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58. Prove the following identities:

$2\sec^2\theta - \sec^4\theta - 2\operatorname{cosec}^2\theta + \operatorname{cosec}^4\theta = \cot^4\theta - \tan^4\theta$

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59. Prove the following identities:

$(\sin\theta + \operatorname{cosec}\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$

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60. Prove the following identity:

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

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61. Prove the following identity: $\frac{tan\theta+sec\theta-1}{tan\theta-sec\theta+1}=\frac{1+\sin\theta}{\cos\theta}$

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

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63. If $a\cos\theta+b\sin\theta=x$ and $a\sin\theta-b\cos\theta=y$ prove that

$a^2+b^2=x^2+y^2$

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64. If $\tan\theta + \sin\theta = m$ and $\tan\theta - \sin\theta = n$ then prove $m^2 - n^2 = 4\sqrt{mn}$

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65. Prove the following identity: $\sec^4\theta - \sec^2\theta = \tan^4\theta + \tan^2\theta$

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66. Prove that $\sin^6\theta + \cos^6\theta = 1 - 3\sin^2\theta\cos^2\theta$

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67. Prove the following identity:

$(\cos ec\theta - \sin\theta)(\sec\theta - \cos\theta)(\tan\theta + \cot\theta) = 1$

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68. Prove the following identity:

$\cos ec\,\theta(sec\theta - 1) - \cot\theta(1 - \cos\theta) = \tan\theta - \sin\theta$

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69. Prove the following identity:

$$\frac{1 - s \in A\cos A}{\cos A(secA - \cos ecA)} \frac{\sin^2 A - \cos^2}{\sin^3 A + \cos^3 A} = \sin A$$

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70. Prove the following identity:

$$\frac{tanA}{1 - \cot A} + \frac{\cot A}{1 - tanA} = (secA\cos ec\,A + 1)$$

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71. Prove the following identity:

$$\frac{\sin^3 A + \cos^3 A}{\sin A + \cos A} + \frac{\sin^3 A - \cos^3 A}{\sin A - \cos A} = 2$$

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72. Prove the following identity:

$$(\sec A \sec B + \tan A \tan B)^2 - (\sec A \tan B + \tan A \sec B)^2 = 1$$

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73. Prove the following identity: $\frac{\cos\theta}{1-\sin\theta} = \frac{1+\cos\theta+\sin\theta}{1+\cos\theta-\sin\theta}$

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74. Prove the following identity:

$$\frac{\tan^3\theta}{1+\tan^2\theta} + \frac{\cot^3\theta}{1+\cot^2\theta} = \frac{1-2\sin^2\theta\cos^2\theta}{\sin\theta\cos\theta}$$

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75. If $\frac{ax}{\cos\theta}+\frac{by}{\sin\theta}=a^2-b^2$, and $\frac{ax\sin\theta}{\cos^2\theta}-\frac{by\cos\theta}{\sin^2\theta}=0$, prove that

$(ax)^{\frac{2}{3}}+(by)^{\frac{2}{3}}=\left(a^2-b^2\right)^{\frac{2}{3}}$

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76. Prove the following identity:

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

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77. Prove the following identity:

$(1+tan\alpha tan\beta)^2+(\tan\alpha-tan\beta)^2=\sec^2\alpha\sec^2\beta$

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78. Prove the following identity:

$$\frac{(1+\cot\theta+tan\theta)(\sin\theta-\cos\theta)}{\sec^3\theta-\cos ec^3\theta}=\sin^2\theta\cos^2\theta$$

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79. Prove the following identity: $\frac{2\sin\theta\cos\theta-\cos\theta}{1-\sin\theta+\sin^2\theta-\cos^2\theta}=\cot\theta$

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80. Prove the following identity:

$$\cos\theta(tan\theta+2)(2tan\theta+1)=2sec\theta+5\sin\theta$$

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81. If $\sin\theta=\frac{a^2-b^2}{a^2+b^2}$, find the value of $tan\theta,\ sec\theta\ and\ \cos ec\theta$

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

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83. If $\cos ec\theta - \sin\theta = a^3$, $\sec\theta - \cos\theta = b^3$, then prove that $a^2b^2\left(a^2 + b^2\right) = 1$

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84. If $\sin\theta + \cos\theta = m$, then prove that $\sin^6\theta + \cos^6\theta = \frac{4 - 3\left(m^2 - 1\right)^2}{4}$, where $m^2 \leq 2$.

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85. Find the values of $\cos\theta$ and $\tan\theta$ when $\sin\theta = -\frac{3}{5}$ and $\pi < \theta < \frac{3\pi}{2}$

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86. If $\cos\theta = -\frac{\sqrt{3}}{2}$ and $\pi < \theta < \frac{3\pi}{2}$ then find the value of $4\tan^2\theta - 3\cos ec^2\theta$

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87. Prove that: $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$ when $\left(-\frac{\pi}{2}\right) < \theta < \frac{\pi}{2}$ and $-\sec\theta + \tan\theta$ when $\frac{\pi}{2} < \theta < \frac{3\pi}{2}$

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88. Find the values of the other five trigonometric functions I each of the following: $\cot\theta = \frac{12}{5}$, θ in quadrant III

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89. Find the values of the other five trigonometric functions in each of the following: $\cos\theta = -\frac{1}{2}$, θ in quadrant II

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90. Find the values of the other five trigonometric functions in each of the following: $tan\theta = \frac{3}{4}$, θ in quadrant III

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91. Find the values of the other five trigonometric functions in each of the following: $\sin\theta = \frac{3}{5}$, θ in quadrant I

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92. If $\sin\theta = \frac{12}{13} and\ \theta$ lies in the second quadrant, find the values of $sec\theta + tan\theta$.

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93. If $\sin\theta = \frac{3}{5}, \tan\phi = \frac{1}{2}$ and $\frac{\pi}{2} < \theta < \pi\phi < \frac{3\pi}{2}$ find the values of $8\tan\theta - \sqrt{5}\sec\phi < \pi < \phi < (3\pi) >$

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94. If $\cos\theta = \frac{3}{5}$ and $\pi < \theta < \frac{3\pi}{2}$ find the values of other five trigonometric functions and hence evaluate $\frac{\cos ec\theta - \cot\theta}{\sec\theta - \tan\theta}$:

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95. Find the values of the following trigonometric ratio: $\sin 315^0$

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96. Find the values of the following trigonometric ratio: $\cos 210^0$

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97. Find the values of the following trigonometric ratio: $\cos(-480^0)$

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98. Find the values of the following trigonometric ratio: $\sin(-1125^\circ)$

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99. Prove that: $\cos 510^0 \cos 330^0 + \sin 390^0 \cos 120^0 = -1.$

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100. Prove that $\frac{\cos(90^0+\theta)\sec(-\theta)\tan(180^0-\theta)}{\sec(360^0-\theta)\sin(180^0+\theta)\cot(90^0-\theta)} = -1.$

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

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102. Find the values of the following trigonometric ratio: $\sin\left(5\frac{\pi}{3}\right)$.

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103. Find the values of the following trigonometric ratio: $\sin 3060^\circ$

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104. Find the values of the following trigonometric ratio: $\tan\left(11\frac{\pi}{6}\right)$

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105. Find the values of the following trigonometric ratio: $\cos(1125^\circ)$

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106. Find the values of the following trigonometric ratio: $\tan 315^0$

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107. Find the values of the following trigonometric ratio: $\cos ec\left(-1200^0\right)$

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108. Find the values of the following trigonometric ratio: $\cos 1755^0$

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109. Find the values of the following trigonometric ratio: $\sin 510^0$

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110. Find the values of the following trigonometric ratio: $\tan(-585^0)$

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111. Find the values of the following trigonometric ratio: $\sin 4530^\circ$

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112. Find the values of the following trigonometric ratio: $\cos 570^\circ$

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113. Find the values of the following trigonometric ratio: $\cos 855^0$

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114. Find the values of the following trigonometric ratio: $\sin(-330^\circ)$

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115. Find the values of the following trigonometric ratio: $\sin 1845^0$

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116. Prove that: $tan225^0 \cot 405^0 + tan765^0 \cot 675^0 = 0$

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117. Prove that: $\frac{\sin(8\pi)}{3}\frac{\cos(23\pi)}{6} + \frac{\cos(13\pi)}{3}\frac{\sin(35\pi)}{6} = \frac{1}{2}$

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~~118.~~ Prove that:

$$\cos 24^0 + \cos 55^0 + \cos 125^0 + \cos 204^\circ + \cos 300^0 = \frac{1}{2}$$

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~~119.~~ Prove that:

$$\tan(-225^0)\cot(-405^0) - \tan(-765^0)\cot(675^0) = 0$$

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~~120. Prove that:~~ $\cos 570^0 \sin 510^0 + \sin(-330^0)\cos(-390^0) = 0$

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~~121.~~

$$\tan\left(\frac{11\pi}{3}\right) - 2\sin\left(\frac{9\pi}{3}\right) - \frac{3}{4}\cos ec^2\left(\frac{\pi}{4}\right) + 4\cos^2\left(\frac{17\pi}{6}\right) = \frac{3-2\sqrt{3}}{2}$$

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122. Prove that: $3\sin\left(\frac{\pi}{6}\right)\sec\left(\frac{\pi}{3}\right) - 4\sin\left(\frac{5\pi}{6}\right)\cot\left(\frac{\pi}{4}\right) = 1$

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123. In a ΔABC prove that $\cos(A+B) + \cos C = 0.$

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124. In a $\Delta(ABC)$ prove that $\cos\left(\frac{\mathrm{A}+\mathrm{B}}{2}\right) = \frac{\sin \mathrm{C}}{2}.$

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125. In a ΔABC prove that $\tan\left(\frac{\mathrm{A}+\mathrm{B}}{2}\right) = \cot\left(\frac{\mathrm{C}}{2}\right)$

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126. If A, B, C, D be the angles of a cyclic quadrilateral, taken in order, prove that:

$\cos(180^\circ - A) + \cos(180^\circ + B) + \cos(180^\circ + C) - \sin(90^\circ + D) = 0$

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127. Find x from the following equation:

$\cos ec(90^\circ + \theta) + x \cos\theta \cot(90^\circ + \theta) = \sin(90^\circ + \theta)$

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128. Find x from the following equation:

$x \cot(90^0 + \theta) + \tan(90^0 + \theta)\sin\theta + \cos ec(90^0 + \theta) = 0$

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129. Prove that: $tan720^0 - \cos 270^0 - s \in 150^0 \cos 120^0 = \frac{1}{4}$

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130. Prove that: $\sin 780^0 \sin 480^0 + \cos 120^0 \sin 150^0 = \frac{1}{2}$

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131. Prove that: $\sin 780^0 \sin 120^0 + \cos 240^0 \sin 390^0 = \frac{1}{2}$

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132. Prove that: $\sin 600^0 \cos 390^0 + \cos 480^0 \sin 150^0 = -1$

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133. $\tan 225^\circ \cot 405^\circ + \tan 765^\circ \cot 675^\circ = 0$

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134. Write the maximum and minimum values of $\cos(\cos x)$

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135. Write the maximum and minimum values of $s \in (s \in x)$.

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136. Write the maximum value of $\sin(\cos x)$.

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137. If $\sin x = \cos^2 x$, then write the value of $\cos^2 x \left(1 + \cos^2 x\right)$.

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138. If $\sin x + \cos ec\, x = 2$, then write the value of $\sin^n x + \cos ec^n x$.

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139. If $\sin\theta_1 + \sin\theta_2 + \sin\theta_3 = 3$, then $\cos\theta_1 + \cos\theta_2 + \cos\theta_3$ is equal to 3 (b) 2 (c) 1 (d) 0

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140. Write the value of $\sin 10^0 + \sin 20^0 + \sin 30^0 + \ldots + \sin 360^\circ$

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141. A circular wire of radius 15cm is cut and bent so as to lie along the circumference f a loop of radius 120 cm. write the measure of the angle subtended by it at the centre of the loop.

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~~142. The value for~~ $2\left(\sin^6\theta+\cos^6\theta\right)-3\left(\sin^4\theta+\cos^4\theta\right)$ ~~+1 is~~

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~~143. Write the value of~~ $\cos 1^0+\cos 2^0+\cos 3^0+\ +\cos 180^0$.

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~~144. If~~ $\cot(\alpha+\beta)=0$, ~~then write the value of~~ $\sin(\alpha+2\beta)$~~.~~

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~~145. If~~ $tanA+\cot A=4$, ~~then write the value of~~ $tan^4A+\cot^4A$.

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146. Write the least value of $\cos^2\theta + \sec^2\theta$.

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147. If $x = \sin^{14}\theta + \cos^{20}\theta$, then write the smallest interval in which the value of x lie.

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148. If $3\sin\theta + 5\cos\theta = 5$, then write the value of $5\sin\theta - 3\cos\theta$.

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149. If $\sec\theta = x + \frac{1}{4x}$, then $sec\theta - tan\theta$ is equal to $-2x$, $\frac{1}{2x}$ b. $\frac{1}{2x}$, $2x$ c. $2x$ d. $2x$, $\frac{1}{2x}$

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150. If $\frac{\pi}{2} < \theta < \frac{3\pi}{2}$ then $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} =$

$a.\ \sec\theta - \tan\theta$, $b.\ \sec\theta + \tan\theta$, $c.\ \tan\theta - \sec\theta$, $d.$ none of these

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151. If $\pi < \theta < 2\pi$ then $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} =$ a. $\cos ec\theta + \cot\theta$, b. $\cos ec\theta - \cot\theta$, c. $\cot\theta - \cos ec\theta$, d. $-\cos ec\theta - \cot\theta$

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152. If $\sec\theta = x + \frac{1}{4x}$ then $\sec\theta + \tan\theta =$

$a,\ x, \frac{1}{x}$, $b.\ 2x, \frac{1}{2x}$, $c.\ -2x, \frac{1}{2x}$, $d.\ -\frac{1}{x}, x$

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153. If $\frac{\pi}{2} < \theta < \pi$, then $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} + \sqrt{\frac{1+\sin\theta}{1-\sin\theta}}$ is equal to a. $2\sec\theta$ b. $-2\sec\theta$ c. $\sec\theta$ d. $-\sec\theta$

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154. If `tan theta+sectheta=sqrt(3),\ 0

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155. If $tan\theta = -\frac{1}{\sqrt{5}}$ and θ lies in the IVB quadrant, then the value of $\cos\theta$ is a. $\frac{\sqrt{5}}{\sqrt{6}}$ b. $\frac{2}{\sqrt{6}}$ c. $\frac{1}{2}$ d. $\frac{1}{\sqrt{6}}$

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156. Prove the followings : $\sin^6 A + \cos^6 A + 3\sin^2 A \cos^2 A = 1$

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

$a.\frac{.5}{3}, b.\ \frac{3}{5}, c.\ -\frac{3}{5}, d.\ -\frac{5}{3}$

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158. If θ is an acute angle and $tan\theta = \frac{1}{\sqrt{7}}$, then the value of $\frac{\cos ec^2\theta - \sec^2\theta}{\cos ec^2\theta + \sec^2\theta}$ is $3/4$ b. $1/2$ c. 2 d. $5/4$

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159. Find the value of

$\sin^2 5^\circ + \sin^2 10^\circ + \sin^2 15^\circ + \ldots\ldots + \sin^2 85^\circ + \sin^2 90^\circ =$

A. 8

B. 9

C. 8.5

D. 9.5

Answer: D

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160. If $tanA + \cot A = 4$, then $\tan^4 A + \cot^4 A$ is equal to

a. 110 b. 191 c. 80 d. 194

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161. If $x \sin 45^\circ \cos^2 60^\circ = \frac{\tan^2 60^\circ \cos ec30^\circ}{sec45^\circ \cot^2 30^\circ}$, $then\ x =$ 2 b. 4 c. 8 d. 16

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162. 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) $\frac{117}{44}$

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163. If $\operatorname{cosec}\theta - \cot\theta = \frac{1}{2}, 0 < \theta < \frac{\pi}{2}$ then $\cos\theta =$

$a.\frac{.5}{3}, b.\ \frac{3}{5}, c.\ -\frac{3}{5}, d.\ -\frac{5}{3}$

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164. If $sec\theta + tan\theta = k,\ \cos\theta =$

a. $\frac{k^2+1}{2k}$ b. $\frac{2k}{k^2+1}$ c. $\frac{k}{k^2+1}$ d. $\frac{k}{k^2-1}$

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165. Which of the following is incorrect? $\sin\theta = -1/5$ b. $\cos\theta = 1$ c. $sec\theta = 1/2$ d. $tan\theta = 20$

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166. The value of $\cos 1^\circ . \cos 2^\circ . \cos 3^\circ .... \cos 179^\circ =$

$a. \frac{1}{\sqrt{2}}, b.0, c.1, d. -1$

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167. The value of $\tan 1^0 \tan 2^0 tan 3^0 ..... . tan 89^0$ is

A. 0

B. 1

C. 2

D. None of these

Answer: B

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