MATHS

BOOKS - RD SHARMA MATHS (ENGLISH)

TRIGONOMETRIC FUNCTIONS

Others

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

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2. Prove that:

$$\frac{\sin(180^0+\theta)\cos(90^0+\theta)\tan(270^0-\theta)\cot(360^0-\theta)}{\sin(360^0-\theta)\cos(360^0+\theta)\cos ec(-\theta)\sin(270^0+\theta)}=1$$

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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: $\frac{tan(90^0-\theta)sec(180^0-\theta)\sin(-\theta)}{\sin(180^0+\theta)\cot(360^0-\theta)\cos ec(90^0-\theta)}=1$

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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: $\sin^2\left(\frac{\pi}{6}\right)+\cos^2\left(\frac{\pi}{3}\right)-tan^2\frac{\pi}{4}=-\frac{1}{2}$

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

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9. Prove that: $2\sin^2\left(\frac{\pi}{6}\right)+\cos ec^2\left(\frac{7\pi}{6}\right)\cos^2\left(\frac{\pi}{3}\right)=\frac{3}{2}$

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

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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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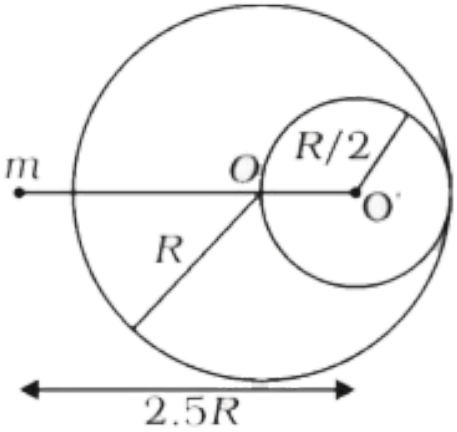
15. A solid sphere of radius R/2 is cut out of a solid sphere of radius R such that the spherical cavity so formed touches the surface on one side and the centre of the sphere on the other side, as shown. The initial mass of the solid sphere was M. If a particle of mass m is placed at a distance 2.5R from the centre of the cavity, then what is the gravitational attraction on the mass m?



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16. If $T_n = \sin^n \theta + \cos^n \theta$, prove that (i) $\frac{T_3 - T_5}{T_1} = \frac{T_5 - T_7}{T_3}$ (ii) $2T_6 - 3T_4 + 1 = 0$ (iii) $6T_{10} - 15T_8 + 10T_6 - 1 = 0$

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17. Prove that: `sqrt((1-sintheta)/(1+s intheta))+sqrt((1+sintheta)/(1-s intheta)=){2/(costheta),if0lt=theta

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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: $sec^2\theta + \cos ec^2\theta \geq 4$.

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22. Given that:

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

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

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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: $2sec^2\theta - sec^4\theta - 2\cos ec^2\theta + \cos ec^4\theta = \dfrac{1 - tan^8\theta}{tan^4\theta}$

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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

A. $-53/10$

B. $23/10$

C. $37/10$

D. $7/10$

Answer: B

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26. Is the following inequality correct? $\sin 1^0 > \sin 1$

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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 (a)$x + y \neq 0$ (b) $x = y, x \neq 0$ (c) $x = y$ (d) $x \neq 0, y \neq 0$

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30. If $\cos ec\theta + \cot\theta = \frac{11}{2}$, then $tan\theta = \frac{21}{22}$ (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 (a) $1 - \cot\alpha$ (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 $(a)\theta, \phi$ (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(1-sintheta)/(1+s intheta)+sqrt((1+sintheta)/(1-s intheta)=){2/(costheta),if0lt=theta

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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. (1) $\cos ec390^0$ (ii) $\cot 570^0$ (iii) $tan480^0$ (iv) $\cos 270^0$ (v) $tan\frac{19\pi}{3}$ (vi) $s \in \left(\frac{-11\pi}{3}\right)$ (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. Prove that: $\frac{\sin^2\pi}{18}+\frac{\sin^2\pi}{9}+\frac{\sin^2(7\pi)}{18}+\frac{\sin^2(4\pi)}{9}=2$

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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

$\sec\theta+tan^3\theta\cos ec\theta=\left(2-a^2\right)^{3/2}$.

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46. If $a\cos^3\theta + 3a\cos\theta\sin^2\theta = m$ 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: $\sqrt{\frac{1+\cos\theta}{1-\cos\theta}} = \operatorname{cosec}\theta + \cot\theta$.

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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:

$\cot^4\theta + \cot^2\theta = \cos ec^4\theta - \mathrm{c\,o\,s\,e\,c^2 theta}$

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58. Prove the following identities:

$2\sec^2\theta - \sec^4\theta - 2\cos ec^2\theta + \cos ec^4\theta = \cot^4\theta - \tan^4\theta$

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59. Prove the following identities:

$(\sin\theta + \cos ec\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$

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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:

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

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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:

$$(secA\ secB + tanA \tan B)^2 - (secA\ tanB + tanA secB)^2 = 1$$

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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 $\cos\theta = -\frac{1}{2}$ 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="" $8 = t = a = n\theta - \sqrt{5} = s = e = c\varphi$<="" b="">

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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: $\sin\left(\frac{5\pi}{3}\right)$.

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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: $\tan\left(\frac{11\pi}{6}\right)$

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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: $\sin 4530^0$

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112. Find the values of the following trigonometric ratio: $\cos 570^0$

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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: $\sin(-330^0)$

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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: $\sin\left(\frac{8\pi}{3}\right)\cos\left(\frac{23\pi}{6}\right) + \cos\left(\frac{13\pi}{3}\right)\sin\left(\frac{35\pi}{6}\right) = \frac{1}{2}$

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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. Prove that :

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

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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 ΔABC prove that $\cos\left(\frac{A+B}{2}\right) = \sin\left(\frac{C}{2}\right)$.

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

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

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

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127. Find x from the following equation:

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

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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: $tan720^0 - \cos 270^0 - \sin 150^0 \cos 120^0 = \frac{1}{4}$

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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. Prove that : $\tan 225^\circ \cot 405^\circ + \tan 765^\circ \cot 675^\circ = 0$

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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 $\sin x$.

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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 (a) 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 of 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 $tan\theta = x - \frac{1}{4x}$, then $sec\theta - tan\theta$ is equal to (a) $-2x, \frac{1}{2x}$ (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 tanθ+secθ=√3,0 <θ<π, then θ is equal to a. $\frac{5\pi}{6}$ b. $\frac{2\pi}{3}$ c. $\frac{\pi}{6}$ d. $\frac{\pi}{3}$

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155. If $tan\theta = -\frac{1}{\sqrt{5}}$ and θ lies in the IV 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. $\sin^6 A + \cos^6 A + 3\sin^2 A\cos^2 A =$ a. 0 b. 1 c. 2 d. 3

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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 a. $3/4$ b. $1/2$ c. 2 d. $5/4$

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

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160. If $tanA + \cot A = 4$, then $\tan^4 A + \cot^4 A$ is equal to 110 b. 191 c. 80 d. 194

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161. If $x\sin 45^0 \cos^2 60^0 = \frac{\tan^2 60^0 \cos ec\, 30^0}{sec 45^0 \cot^2 30^0}$, $then\ x =$ 2 b. 4 c. 8 d. 16

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162. If $\cos ec\theta + \cot\theta = \frac{11}{2}$, then $tan\theta =$ $\frac{21}{22}$ (b) $\frac{15}{16}$ (c) $\frac{44}{117}$ (d) $\frac{117}{44}$

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163. 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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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? a. $\sin\theta = -1/5$ b. $\cos\theta = 1$ c. $sec\theta = 1/2$ d. $tan\theta = 1$

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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 $\tan 1^0 \tan 2^0 tan3^0 ..... . tan89^0$ is a. 0 b. 1 c. $1/2$ d. not defined

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