ಎಸ್ ಹರ್ಷ & ಹೆಚ್.ಜಿ. ದೀಪಶ್ರೀ

ತ್ರಿಕೋನಮಿತಿ-ಅನ್ವಯಿಕ ಪ್ರಶ್ನೋತ್ತರಗಳು

ಸರ್ಕಾರಿ ಪ್ರೌಢಶಾಲೆ, ಹೆಡತಲೆ, ನಂಜನಗೂಡು, ಮೈಸೂರು

1) $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}}+\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = 2\sec\theta$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \sqrt{\frac{(1+\sin\theta)\times(1+\sin\theta)}{(1-\sin\theta)\times(1+\sin\theta)}} + \sqrt{\frac{(1-\sin\theta)\times(1-\sin\theta)}{(1+\sin\theta)\times(1-\sin\theta)}}$$

$$= \sqrt{\frac{(1+\sin\theta)^2}{1-\sin^2\theta}} + \sqrt{\frac{(1-\sin\theta)^2}{1-\sin^2\theta}}$$

$$= \sqrt{\frac{(1+\sin\theta)^2}{\cos^2\theta}} + \sqrt{\frac{(1-\sin\theta)^2}{\cos^2\theta}}$$

$$= \frac{1+\sin\theta}{\cos\theta} + \frac{1-\sin\theta}{\cos\theta}$$

$$= \frac{1+\sin\theta+1-\sin\theta}{\cos\theta}$$

$$= \frac{2}{\cos\theta}$$

$$= 2\sec\theta = \text{RHS}$$

2) $\frac{1+\sin\theta}{1-\sin\theta} - \frac{1-\sin\theta}{1+\sin\theta} = 4\sec\theta\tan\theta$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{1+\sin\theta}{1-\sin\theta} - \frac{1-\sin\theta}{1+\sin\theta}$$

$$= \frac{1+\sin\theta}{1-\sin\theta} \times \frac{1+\sin\theta}{1+\sin\theta} - \frac{1-\sin\theta}{1+\sin\theta} \times \frac{1-\sin\theta}{1-\sin\theta}$$

$$= \frac{(1+\sin\theta)^2}{1-\sin^2\theta} - \frac{(1-\sin\theta)^2}{1-\sin^2\theta}$$

$$= \frac{(1+\sin\theta)^2 - (1-\sin\theta)^2}{1-\sin^2\theta}$$

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

$$= \frac{4\sin\theta}{\cos^2\theta}$$

$$= 4 \times \frac{\sin\theta}{\cos\theta} \times \frac{1}{\cos\theta}$$

$$= 4\sec\theta\tan\theta$$

$$= \text{RHS}$$

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3) $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \sqrt{\frac{(1-\sin\theta)\times(1-\sin\theta)}{(1+\sin\theta)\times(1-\sin\theta)}}$$

$$= \sqrt{\frac{(1-\sin\theta)^2}{1-\sin^2\theta}}$$

$$= \sqrt{\frac{(1-\sin\theta)^2}{\cos^2\theta}}$$

$$= \frac{1-\sin\theta}{\cos\theta}$$

$$= \frac{1}{\cos\theta} - \frac{\sin\theta}{\cos\theta}$$

$$= \sec\theta - \tan\theta$$

$$= \text{RHS}$$

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4) $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\tan\theta+\cot\theta$ ಎಂದು ಸಾಧಿಸಿ.

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$$LHS=\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}$$

$$=\frac{\frac{\sin\theta}{\cos\theta}}{1-\frac{\cos\theta}{\sin\theta}}+\frac{\frac{\cos\theta}{\sin\theta}}{1-\frac{\sin\theta}{\cos\theta}}$$

$$=\frac{\frac{\sin\theta}{\cos\theta}}{\frac{\sin\theta-\cos\theta}{\sin\theta}}+\frac{\frac{\cos\theta}{\sin\theta}}{\frac{\cos\theta-\sin\theta}{\cos\theta}}$$

$$=\frac{\sin^2\theta}{\cos\theta(\sin\theta-\cos\theta)}+\frac{\cos^2\theta}{\sin\theta(\cos\theta-\sin\theta)}$$

$$=\frac{\sin^3\theta-\cos^3\theta}{\sin\theta\cos\theta(\sin\theta-\cos\theta)}$$

$$=\frac{(\sin\theta-\cos\theta)(\sin^2\theta+\cos^2\theta+\sin\theta\cos\theta)}{\sin\theta\cos\theta(\sin\theta-\cos\theta)}$$

$$=\frac{\sin^2\theta}{\sin\theta\cos\theta}+\frac{\cos^2\theta}{\sin\theta\cos\theta}+\frac{\sin\theta\cos\theta}{\sin\theta\cos\theta}$$

$$=\frac{\sin\theta}{\cos\theta}+\frac{\cos\theta}{\sin\theta}+1$$

$$=1+\tan\theta+\cot\theta=RHS$$

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5) $\tan^2\theta + \cot^2\theta + 2 = \sec^2\theta\,\text{cosec}^2\theta$ ಎಂದು ಸಾಧಿಸಿ.

$LHS = \tan^2\theta + \cot^2\theta + 2$

$= \sec^2\theta - 1 + \text{cosec}^2\theta - 1 + 2$

$= \sec^2\theta + \text{cosec}^2\theta$

$= \frac{1}{\cos^2\theta} + \frac{1}{\sin^2\theta}$

$= \frac{\sin^2\theta + \cos^2\theta}{\cos^2\theta\,\sin^2\theta}$

$= \frac{1}{\cos^2\theta\,\sin^2\theta}$

$= \frac{1}{\cos^2\theta} \times \frac{1}{\sin^2\theta}$

$= \sec^2\theta\,\text{cosec}^2\theta$

$= RHS$

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6) $\frac{\sin\theta}{1-\cos\theta} = \operatorname{cosec}\theta + \cot\theta$ ಎಂದು ಸಾಧಿಸಿ

$$\text{LHS} = \frac{\sin\theta}{1-\cos\theta}$$

$$= \frac{\sin\theta}{1-\cos\theta} \times \frac{1+\cos\theta}{1+\cos\theta}$$

$$= \frac{\sin\theta\,(1+\cos\theta)}{1-\cos^2\theta}$$

$$= \frac{\sin\theta\,(1+\cos\theta)}{\sin^2\theta}$$

$$= \frac{(1+\cos\theta)}{\sin\theta}$$

$$= \frac{1}{\sin\theta} + \frac{\cos\theta}{\sin\theta} \quad = \operatorname{cosec}\theta + \cot\theta \quad = \text{RHS}$$

7) $\frac{tan\,\theta+sin\,\theta}{tan\,\theta-sin\,\theta} = \frac{Sec\,\theta+1}{Sec\,\theta-1}$ ಎಂದು ಸಾಧಿಸಿ.

LHS $= \frac{tan\,\theta+sin\,\theta}{tan\,\theta-sin\,\theta}$

$= \frac{\frac{sin\,\theta}{cos\,\theta}+sin\,\theta}{\frac{sin\,\theta}{cos\,\theta}-sin\,\theta}$

$= \frac{\frac{sin\,\theta+sin\,\theta\,cos\,\theta}{cos\theta}}{\frac{sin\,\theta-sin\,\theta\,cos\,\theta}{cos\theta}}$

$= \frac{sin\,\theta}{sin\theta}\left[\frac{1+cos\,\theta}{1-cos\,\theta}\right]$

$= \frac{1+\frac{1}{sec\theta}}{1-\frac{1}{sec\theta}}$

$= \frac{Sec\,\theta+1}{Sec\,\theta-1}$

= RHS

8) $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3 - \cos\theta} = \tan\theta$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta}$

$= \frac{\sin\theta\,(1 - 2\sin^2\theta)}{\cos\theta(2\cos^2\theta - 1)}$

$= \tan\theta \left[\frac{(\sin^2\theta + \cos^2\theta - 2\sin^2\theta)}{2\cos^2\theta - (\,(\sin^2\theta + \cos^2\theta)}\right]$

$= \tan\theta \frac{\left|\cos^2\theta - \sin^2\theta\right|}{\left|\cos^2\theta - \sin^2\theta\right|}$

$= \tan\theta$ = RHS

9) $\sqrt{\frac{sec\,\theta-1}{sec\,\theta+1}}+\sqrt{\frac{sec\,\theta+1}{sec\,\theta-1}} = 2\,cosec\,\theta$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $\sqrt{\frac{sec\,\theta-1}{sec\,\theta+1}}+\sqrt{\frac{sec\,\theta+1}{sec\,\theta-1}}$

$= \sqrt{\frac{(sec\,\theta-1)\,(sec\,\theta-1)}{(sec\,\theta+1)\,(sec\,\theta-1)}}+\sqrt{\frac{(sec\,\theta+1)\,(sec\,\theta+1)}{(sec\,\theta-1)\,(sec\,\theta+1)}}$

$= \sqrt{\frac{(sec\,\theta-1)^2}{sec^2\,\theta-1}}+\sqrt{\frac{(sec\,\theta+1)^2}{sec^2\,\theta-1}}$

$= \sqrt{\frac{(sec\,\theta-1)^2}{tan^2\,\theta}}+\sqrt{\frac{(sec\,\theta+1)^2}{tan^2\,\theta}}$

$= \frac{sec\theta-1}{tan\theta}+\frac{sec\theta+1}{tan\theta}$

$= \frac{sec\theta-1+sec\theta+1}{tan\theta}$

$= \frac{2sec\theta}{tan\theta}$

$= \frac{2\frac{1}{cos\theta}}{\frac{sin}{cos\theta}}$

$= \frac{2}{sin\theta}$

$= 2\,cosec\,\theta$

= RHS

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10) (1+ $cot\,\theta$- $cosec\,\theta$) (1+ $tan\,\theta$ + $sec\,\theta$) = 2 ಎಂದು ಸಾಧಿಸಿ.

LHS = (1+ cot Θ-cosec Θ) (1+tan Θ+sec Θ)

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

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

$$= \left[\frac{\{(\sin\theta+\cos\theta)-1\}\{(\sin\theta+\cos\theta)+1\}}{\sin\theta\cos\theta}\right]$$

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

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

$$= \frac{1+2\sin\theta\cos\theta-1}{\sin\theta\cos\theta}$$

$$= \frac{2\sin\theta\cos\theta}{\sin\theta\cos\theta}$$

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

= 2

= RHS

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11) $\frac{cot\ A+cosec\ A-1}{cot\ A-cosec\ A+1} = \frac{1+cos\ A}{cin\ A}$ ಎಂದು ಸಾಧಿಸಿ.

LHS $= \frac{cot\ A+cosec\ A-1}{cot\ A-cosec\ A+1}$

$= \frac{cot\ A+cosec\ A-\left(cosec^{2}A-cot^{2}A\right)}{cot\ A-cosec\ A+1}$

$= \frac{(cot\ A+cosec\ A)-\{(cosec\ A+cot\ A)(cosec\ A-cot\ A)\}}{cot\ A-cosec\ A+1}$

$= \frac{(cot\ A+cosec\ A)(1-cosec\ A+cot\ A)}{(cot\ A-cosec\ A+1)}$

$= (cot\ A + cosec\ A)$

$= \frac{cos\ A}{sin\ A} + \frac{1}{sin\ A}$

$= \frac{1+cos\ A}{sin\ A}$

= RHS

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12) $\frac{\cos A-\sin A+1}{\cos A+\sin A+1}=\frac{1}{\tan A+\sec A}$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $\frac{\cos A-\sin A+1}{\cos A+\sin A+1}$

$=\frac{\frac{\cos A}{\cos A}-\frac{\sin A}{\cos A}+\frac{1}{\cos A}}{\frac{\cos A}{\cos A}+\frac{\sin A}{\cos A}+\frac{1}{\cos A}}$

$=\frac{1-\tan A+\sec A}{1+\tan A+\sec A}$

$=\frac{(1-\tan A+\sec A)}{(\sec^2 A-\tan^2 A)+(\tan A+\sec A)}$

$=\frac{(1-\tan A+\sec A)}{(\sec A+\tan A)\,(\sec A-\tan A)+(\tan A+\sec A)}$

$=\frac{(1-\tan A+\sec A)}{(\sec A+\tan A)\,(\sec A-\tan A+1)}$

$=\frac{1}{\tan A+\sec A}$

= RHS

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13) $(\text{cosec}\,\theta - \sin\theta)(\sec\theta - \cos\theta) = \frac{1}{\tan\theta + \cot\theta}$ ಎಂದು ಸಾಧಿಸಿ.

LHS = (cosec θ-sin θ)(sec θ-cos θ)

$= \left(\frac{1}{\sin\theta} - \sin\theta\right)\left(\frac{1}{\cos\theta} - \cos\theta\right)$

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

$= \frac{\cos^2\theta \; X \; \sin^2\theta}{\sin\theta\,\cos\theta}$

= sin θ cos θ ---------->①

RHS $= \frac{1}{\tan\theta + \cot\theta}$

$= \frac{1}{\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}}$

$= \frac{1}{\frac{\sin^2\theta + \cos^2\theta}{\cos\theta\,\sin\theta}}$

$= \frac{\cos\theta\,\sin\theta}{1}$

= sin θ cos θ ------->②

① ಮತ್ತು ② ರಿಂದ LHS = RHS

14) $\left(1+\frac{1}{\tan^2\theta}\right)\left(1+\frac{1}{\cot^2\theta}\right)=\frac{1}{\sin^2\theta-\sin^4\theta}$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $\left(1+\frac{1}{\tan^2\theta}\right)\left(1+\frac{1}{\cot^2\theta}\right)$

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

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

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

$= \frac{1}{\sin^2\theta \; x \; \cos^2\theta)}$

$= \frac{1}{\sin^2\theta\,(1-\sin^2\theta)}$

$= \frac{1}{\sin^2\theta-\sin^4\theta}$

= RHS

15) $sec^2\theta - \frac{sin^2\theta - 2sin^4\theta}{2cos^4\theta - cos^2\theta} = 1$ ఎందు సాధిసి.

LHS = $sec^2\theta - \frac{sin^2\theta - 2sin^4\theta}{2cos^4\theta - cos^2\theta}$

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

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

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

$= sec^2\theta - tan^2\theta$

$= 1$

= RHS

16) (1+ cot A+ tan A)(sin A-cos A) = sin A tan A – cot A cos A ಎಂದು ಸಾಧಿಸಿ.

RHS = sin A tan A – cot A cos A

$= \sin A \frac{\sin A}{\cos A} - \frac{\cos A}{\sin A} \cos A$

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

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

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

$= (\sin A - \cos A)\left(\frac{\sin^2 A}{\sin A \cos A} + \frac{\cos^2 A}{\sin A \cos A} + \frac{\sin A \cos A}{\sin A \cos A}\right)$

$= (\sin A - \cos A)$(tan A + cot A+1)

= LHS

17) $\frac{\sin\theta}{\cot\theta+\operatorname{cosec}\theta} = 2 + \frac{\sin\theta}{\cot\theta-\operatorname{cosec}\theta}$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{\sin\theta}{\cot\theta+\operatorname{cosec}\theta}$$

$$= \frac{\sin\theta}{\cot\theta+\operatorname{cosec}\theta} \times \frac{\operatorname{cosec}\theta-\cot\theta}{\operatorname{cosec}\theta-\cot\theta}$$

$$= \frac{\sin\theta\operatorname{cosec}\theta-\sin\theta\cot\theta}{\operatorname{cosec}^2\theta-\cot^2\theta}$$

$$= \frac{\sin\theta \times \frac{1}{\sin\theta} - \sin\theta \times \frac{\cos\theta}{\sin\theta}}{1}$$

$$= 1 - \cos\theta \text{ ----- } \rightarrow ①$$

①ಮತ್ತು② ರಿಂದ LHS=RHS

$$\text{RHS} = 2 + \frac{\sin\theta}{\cot\theta-\operatorname{cosec}\theta}$$

$$= \frac{2\cot\theta-2\operatorname{cosec}\theta+\sin\theta}{\cot\theta-\operatorname{cosec}\theta}$$

$$= \frac{2\frac{\cos\theta}{\sin\theta}-2\frac{1}{\sin\theta}+\sin\theta}{\frac{\cos\theta}{\sin\theta}-\frac{1}{\sin\theta}}$$

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

$$= \frac{2\cos\theta-2+1-\cos^2\theta}{\cos\theta-1}$$

$$= \frac{2\cos\theta-1-\cos^2\theta}{\cos\theta-1}$$

$$= \left|\frac{-\{\cos\theta-1\}^2}{\cos\theta-1}\right|$$

$$= -(\cos\theta-1) = 1-\cos\theta \text{ ----- } \rightarrow ②$$

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18) $\frac{\sin\theta}{1-\cos\theta}+\frac{\tan\theta}{1+\cos\theta}$ = cotθ + secθ cosecθ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{\sin\theta}{1-\cos\theta}+\frac{\tan\theta}{1+\cos\theta}$$

$$= \frac{\sin\theta(1+\cos\theta)+\tan\theta(1-\cos\theta)}{(1-\cos\theta)(1+\cos\theta)}$$

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

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

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

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

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

$$= \frac{\sin\theta\cos^2\theta}{\cos\theta\sin^2\theta}+\frac{\sin\theta}{\cos\theta\sin^2\theta}$$

$$= \frac{\cos\theta}{\sin\theta}+\frac{1}{\cos\theta\sin\theta}$$

= cotθ+ secθ cosecθ = RHS

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19) x $sin^3\theta$+y $cos^3\theta$ = $sin\theta\ cos\theta$ ಮತ್ತು x $cos\theta$ = y $cos\theta$ ಆದಾಗ $x^2 + y^2 = 1$ ಎಂದು ಸಾಧಿಸಿ.

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x $sin^3\theta$ + y $cos^3\theta$ = $sin\theta\ cos\theta$

X $sin\theta\ sin^2\theta$ + y cosΘ $cos^2\theta$= $sin\theta\ cos\theta$

y $cos\theta\ sin^2\theta$+ y $cos\theta\ cos^2\theta$= $sin\theta\ cos\theta$

y $cos\theta\ (sin^2\theta + cos^2\theta) = sin\theta\ cos\theta$

y $cos\theta\ (1) = sin\theta\ cos\theta$

y = $sin\theta$

ಇದೇ ರೀತಿಯಲ್ಲಿ x= $cos\theta$

$x^2 + y^2 = cos^2\theta + sin^2\theta$

$x^2 + y^2 = 1$

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20) $\frac{1+CosA}{1-CosA} = (cosecA + cotA)^2$ ಎಂದು ಸಾಧಿಸಿ.

$$RHS = \frac{1+cosA}{1-cosA} \times \frac{1+cosA}{1+cosA}$$

$$= \frac{(1+cosA)^2}{1-cos^2A}$$

$$= \frac{1 + cos^2A + 2\,cosA}{sin^2A}$$

$$= \frac{1}{sin^2A} + \frac{cos^2A}{sin^2A} + \frac{2cosA}{sin^2A}$$

$$= cosec^2A + cot^2A + 2\,cotA\,cosecA$$

$$= (cosecA + cotA)^2 = RHS$$

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21) $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} = \sec\theta + \tan\theta$ ಎಂದು ಸಾಧಿಸಿ.

LHS $= \sqrt{\frac{(1+\sin\theta)\times(1+\sin\theta)}{(1-\sin\theta)\times(1+\sin\theta)}}$

$= \sqrt{\frac{(1+\sin\theta)^2}{1-\sin^2\theta}}$

$= \sqrt{\frac{(1+\sin\theta)^2}{\cos^2\theta}}$

$= \frac{1+\sin\theta}{\cos\theta}$

$= \frac{1}{\cos\theta} + \frac{\sin\theta}{\cos\theta}$

$= \sec\theta + \tan\theta$

= RHS

22) $\frac{\tan A+\sec A-1}{\tan A-\sec A+1} = \frac{1+\sin A}{\cos A}$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $\frac{\tan A+\sec A-1}{\tan A-\sec A+1}$

$= \frac{\tan A+\sec A-(\sec^2 A-\tan^2 A)}{\tan A-\sec A+1}$

$= \frac{(\tan A+\sec A)-\{(\sec A+\tan A)(\sec A-\tan A)\}}{\tan A-\sec A++1}$

$= \frac{(\tan A+\sec A)(1-\sec A+\tan A)}{(\tan A-\sec A+1)}$

$= (\tan A+\sec A)$

$= \frac{\sin A}{\cos A} + \frac{1}{\cos A}$

$= \frac{\sin A+1}{\cos A}$

= RHS

23) $\frac{\sin(90-A)}{1-\tan A} + \frac{\cos(90-A)}{1-\cot A} = \cos A + \sin A$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{\sin(90-A)}{1-\tan A} + \frac{\cos(90-A)}{1-\cot A}$$

$$= \frac{\cos A}{1-\frac{\sin A}{\cos A}} + \frac{\sin A}{1-\frac{\cos A}{\sin A}}$$

$$= \frac{\cos A}{\frac{\cos A - \sin A}{\cos A}} + \frac{\sin A}{\frac{\sin A - \cos A}{\sin A}}$$

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

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

$$= \frac{(\cos A - \sin A)(\cos A + \sin A)}{(\cos A - \sin A)}$$

$$= \cos A + \sin A$$

$$= \text{RHS}$$

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24) $\frac{\cos\theta}{\sec\theta-\tan\theta} = 1+\sin\theta$ ಎಂದು ಸಾಧಿಸಿ

$$\text{LHS} = \frac{\cos\theta}{\sec\theta-\tan\theta}$$

$$= \frac{\cos\theta}{\frac{1}{\cos\theta}-\frac{\sin\theta}{\cos\theta}}$$

$$= \frac{\cos^2\theta}{1-\sin\theta}$$

$$= \frac{1-\sin^2\theta}{1-\sin\theta}$$

$$= \frac{(1+\sin\theta)(1-\sin\theta)}{(1-\sin\theta)}$$

$$= 1+\sin\theta = \text{RHS}$$

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25) $\frac{cosecA+1}{cosecA-1} = (secA + tanA)^2$ ಎಂದು ಸಾಧಿಸಿ .

$$LHS = \frac{cosecA+1}{cosecA-1} \; X \; \frac{cosecA+1}{cosecA+1}$$

$$= \frac{\cos\theta}{\frac{1}{\cos\theta} - \frac{\sin\theta}{\cos\theta}}$$

$$= \frac{(cosecA+1)^2}{cosec^2A-1}$$

$$= \frac{cosec^2A+1+2\,cosecA}{cot^2A}$$

$$= \frac{cosec^2A}{cot^2A} + \frac{1}{cot^2A} + \frac{2\,cosecA}{cot^2A}$$

$$= \frac{\frac{1}{sin^2A}}{\frac{cos^2A}{sin^2A}} + \frac{1}{cot^2A} + \frac{2\frac{1}{sinA}}{\frac{cosA\,cosA}{sinA\,sinA}}$$

$$= \frac{1}{cos^2A} + tan^2A + \frac{2sinA}{cosAcosA}$$

$$= sec^2A + tan^2A + 2secAtanA$$

$$= (secA + tanA)^2$$

= RHS

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26) $sec^4A - sec^2A = tan^4A + tan^2A$ ಎಂದು ಸಾಧಿಸಿ.

$$LHS = sec^4A - sec^2A$$

$$= sec^2A \; sec^2A - sec^2A$$

$$= sec^2A(sec^2A - 1)$$

$$= (tan^2A + 1)tan^2A$$

$$= tan^4A + tan^2A$$

= RHS

27) $tan^2A - sin^2A = tan^2A sin^2A$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $tan^2A - sin^2A$

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

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

$= \frac{sin^2A(1 - cos^2A)}{cos^2A}$

$= \frac{sin^2A \, sin^2A}{cos^2A}$

$= tan^2A \, sin^2A$

= RHS

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28) $\frac{(1+sin\theta-cos\theta)^2}{(1+sin\theta+cos\theta)^2} = \frac{1-cos\theta}{1+cos\theta}$ ಎಂದು ಸಾಧಿಸಿ.

LHS $= \frac{(1+sin\theta-cos\theta)^2}{(1+sin\theta+cos\theta)^2}$

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

$= \frac{1+1+2sin\theta-2sin\theta cos\theta-2cos\theta}{1+1+2sin\theta+2sin\theta cos\theta+2cos\theta}$

$= \frac{2+2sin\theta-2sin\theta cos\theta-2cos\theta}{2+2sin\theta+2sin\theta cos\theta+2cos\theta}$

$= \frac{2(1+sin\theta-sin\theta cos\theta-cos\theta)}{2(1+sin\theta+sin\theta cos\theta+cos\theta)}$

$= \frac{(1-cos\theta+sin\theta-sin\theta cos\theta)}{(1+cos\theta+sin\theta+sin\theta cos\theta)}$

$= \frac{(1-cos\theta)+sin\theta(1-cos\theta)}{(1+cos\theta)+sin\theta(1+cos\theta)}$

$= \frac{(1-cos\theta)(1+sin\theta)}{(1+cos\theta)(1+sin\theta)}$

$= \frac{(1-cos\theta)}{(1+cos\theta)}$

= RHS

29) $\frac{sin^2\,\theta}{1-cos\,\theta} = \frac{1+sec\,\theta}{sec\,\theta}$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{sin^2\,\theta}{1-cos\,\theta}$$

$$= \frac{1-cos^2\,\theta}{1-cos\,\theta}$$

$$= \frac{(1+cos\,\theta)(1-cos\,\theta)}{(1-cos\,\theta)}$$

$$= 1+ \cos\theta$$

$$= 1+ \frac{1}{sec\,\theta}$$

$$= \frac{sec\,\theta+1}{sec\,\theta}$$

$$= \text{RHS}$$

30) $\frac{sinA}{(secA+tanA-1)} + \frac{cosA}{(cosecA+cotA-1)} = 1$ ఎందు సాధిసి.

$$LHS = \frac{sinA}{(secA + tanA - 1)} + \frac{cosA}{(cosecA + cotA - 1)}$$

$$= \frac{sinA}{\left(\frac{1}{cosA} + \frac{sinA}{cosA} - 1\right)} + \frac{cosA}{\left(\frac{1}{sinA} + \frac{cosA}{sinA} - 1\right)}$$

$$= \frac{sinA}{\left(\frac{1 + sinA - cosA}{cosA}\right)} + \frac{cosA}{\left(\frac{1 + cosA - sinA}{sinA}\right)}$$

$$= \frac{sinA\,cosA}{1 + sinA - cosA} + \frac{cosAsinA}{1 + cosA - sinA}$$

$$= \frac{sinA\,cosA}{1 + sinA - cosA} + \frac{cosAsinA}{1 - (sinA - cosA)}$$

$$= \frac{sinA\,cosA\{1 - (sinA - cosA) + cosAsinA\{1 + sinA - cosA\}}{\{1 + sinA - cosA\}\{1 - (sinA - cosA)\}}$$

$$= \frac{sinA\,cosA - sin^2 AcosA + sinAcos^2 A + sinAcosA + sin^2 AcosA - sinAcos^2 A}{1 - (sin^2 A + cos^2 A - 2sinAcosA)}$$

$$= \frac{2sinA\,cosA}{1-(1-2sinA\,cosA)}$$

$$= \frac{2sinA\,cosA}{1-1+2sinA\,cosA}$$

$$= \frac{2sinA\,cosA}{2sinA\,cosA}$$

$$= 1$$

$$= RHS$$

31)$(\sin\theta+\sec\theta)^2+(\cos\theta+\operatorname{cosec}\theta)^2=(1+\sec\theta\operatorname{cosec}\theta)^2$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS}=(\sin\theta+\sec\theta)^2+(\cos\theta+\operatorname{cosec}\theta)^2$$

$$=(\sin\theta+\frac{1}{\cos\theta})^2+(\cos\theta+\frac{1}{\sin\theta})^2$$

$$=(\frac{\sin\theta\cos\theta+1}{\cos\theta})^2+(\frac{\cos\theta\sin\theta+1}{\sin\theta})^2$$

$$=\frac{(\sin\theta\cos\theta+1)^2}{\cos^2\theta}+\frac{(\sin\theta\cos\theta+1)^2}{\sin^2\theta}$$

$$=\frac{(\sin\theta\cos\theta+1)^2\sin^2\theta+(\sin\theta\cos\theta+1)^2\cos^2\theta}{\cos^2\theta\sin^2\theta}$$

$$=\frac{(\sin\theta\cos\theta+1)^2(\sin^2\theta+\cos^2\theta)}{(\sin\theta\cos\theta)^2}$$

$$=(\frac{\sin\theta\cos\theta+1}{\sin\theta\cos\theta})^2$$

$$=(\frac{\sin\theta\cos\theta}{\sin\theta\cos\theta}+\frac{1}{\sin\theta\cos\theta})^2)^2$$

$$=(1+\sec\theta\operatorname{cosec}\theta)^2$$

$$=\text{RHS}$$

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32) $\frac{1}{(cosecA-cotA)} - \frac{1}{(sinA)} = \frac{1}{(sinA)} - \frac{1}{(cosecA+cotA)}$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $\frac{1}{(cosecA-cotA)} - \frac{1}{(sinA)}$

$= \frac{1}{(cosecA-cotA)} \times \frac{(cosecA+cotA)}{(cosecA+cotA)} - \frac{1}{(sinA)}$

$= \frac{(cosecA+cotA)}{(cosec^2 A-cot^2 A)} - \frac{1}{(sinA)}$

$= \frac{(cosecA+cotA)}{1} - cosecA$

$= cosecA + cotA - cosecA$

$= cotA$ ---------->①

LHS = $\frac{1}{(sinA)} - \frac{1}{(cosecA+cotA)}$

$= \frac{1}{(sinA)} - \frac{1}{(cosecA+cotA)} \times \frac{(cosecA-cotA)}{(cosecA-cotA)}$

$= cosecA - \frac{(cosecA-cotA)}{(cosec^2 A-cot^2 A)}$

$= cosecA - \frac{(cosecA-cotA)}{1}$

$= cosecA - cosecA + cot A$

$= cotA$ ------->②

① ಮತ್ತು ② ರಿಂದ LHS = RHS

33) $\frac{cosec^2A+1}{cosec^2A-1} = sec^2A + tan^2A$ ಎಂದು ಸಾಧಿಸಿ .

LHS = $\frac{cosec^2A+1}{cosec^2A-1}$

$= \frac{\frac{1}{sin^2A}+1}{\frac{1}{sin^2A}-1}$

$= \frac{\frac{1+sin^2A}{sin^2A}}{\frac{1-sin^2A}{sin^2A}}$

$= \frac{1+sin^2A}{1-sin^2A}$

$= \frac{1+sin^2A}{cos^2A}$

$= \frac{1}{cos^2A} + \frac{sin^2A}{cos^2A}$

$= sec^2A + tan^2A$

= RHS

34) $\sqrt{sec^2\,\theta + cosec^2\,\theta} = \tan\theta + \cot\theta$ ಎಂದು ಸಾಧಿಸಿ.

LHS $= \sqrt{sec^2\,\theta + cosec^2\,\theta}$

$= \sqrt{\frac{1}{cos^2\,\theta} + \frac{1}{sin^2\,\theta}}$

$= \sqrt{\frac{sin^2\,\theta + cos^2\,\theta}{cos^2\,\theta\, sin^2\,\theta}}$

$= \sqrt{\frac{1}{cos^2\,\theta\, sin^2\,\theta}}$

$= \sqrt{sec^2\,\theta\, cosec^2\,\theta}$

$= sec\theta\, cosec\,\theta$

RHS $= \tan\theta + \cot\theta$

$= \frac{sin\,\theta}{cos\,\theta} + \frac{cos\,\theta}{sin\,\theta}$

$= \frac{sin^2\,\theta + cos^2\,\theta}{sin\,\theta\, cos\,\theta}$

$= \frac{1}{sin\,\theta\, cos\,\theta}$

$= sec\theta\, cosec\,\theta$

= RHS

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36) $\frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta} = 2\,cosec\,\theta$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{\sin\theta}{1+\cos\theta} + \frac{1+\cos\theta}{\sin\theta}$$

$$= \frac{\sin^2\theta+(1+\cos\theta)^2}{\sin\theta(1+\cos\theta)}$$

$$= \frac{\sin^2\theta+1+\cos^2\theta+2\cos\theta}{\sin\theta(1+\cos\theta)}$$

$$= \frac{1+1+2\cos\theta}{\sin\theta(1+\cos\theta)}$$

$$= \frac{2+2\cos\theta}{\sin\theta(1+\cos\theta)}$$

$$= \frac{2(1+\cos\theta)}{\sin\theta(1+\cos\theta)}$$

$$= 2\,cosec\,\theta$$

= RHS

36) $(\sin\theta + \cos\theta)(\tan\theta + \cot\theta) = \sec\theta + \operatorname{cosec}\theta$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $(\sin\theta + \cos\theta)(\tan\theta + \cot\theta)$

$= (\sin\theta + \cos\theta)\left(\frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}\right)$

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

$= (\sin\theta + \cos\theta)\left(\frac{1}{\cos\theta\sin\theta}\right)$

$= \left(\frac{\sin\theta}{\cos\theta\sin\theta} + \frac{\cos\theta}{\cos\theta\sin\theta}\right)$

$= \left(\frac{1}{\cos\theta} + \frac{1}{\sin\theta}\right)$

$= \sec\theta + \operatorname{cosec}\theta$

= RHS

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37) $1 + \frac{cot^2 A}{1+cosecA} = cosecA$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = 1 + \frac{cot^2 A}{1+cosecA}$$

$$= 1 + \frac{cosec^2 A - 1}{1+cosecA}$$

$$= 1 + \frac{cosec^2 A - 1}{1+cosecA}$$

$$= 1 + \frac{(cosecA - 1)(cosecA + 1)}{(1+cosecA)}$$

$$= 1 + cosecA - 1$$

$$= cosecA$$

$$= \text{RHS}$$

38) $\frac{\tan\theta}{1+\sec\theta} - \frac{\tan\theta}{1-\sec\theta} = 2\operatorname{cosec}\theta$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{\tan\theta}{1+\sec\theta} - \frac{\tan\theta}{1-\sec\theta}$$

$$= \tan\theta\left[\frac{1}{1+\sec\theta} - \frac{1}{1-\sec\theta}\right]$$

$$= \tan\theta\left[\frac{1-\sec\theta-1-\sec\theta}{(1+\sec\theta)(1-\sec\theta)}\right]$$

$$= \tan\theta\left[\frac{-2\sec\theta}{(1-\sec^2\theta)}\right]$$

$$= \tan\theta\left[\frac{-2\sec\theta}{-\tan^2\theta}\right]$$

$$= \left[\frac{\frac{2}{\cos\theta}}{\frac{\sin\theta}{\cos\theta}}\right]$$

$$= 2\frac{1}{\sin\theta}$$

$$= 2\operatorname{cosec}\theta$$

$$= \text{RHS}$$

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39) $secA = x + \frac{1}{4x}$ ಆದರೆ $secA + tan\,A = 2x$ ಎಂದು ಸಾಧಿಸಿ.

$$secA = x + \frac{1}{4x}$$

ವರ್ಗಗೊಳಿಸಿದಾಗ

$$sec^2A = \left(x + \frac{1}{4x}\right)^2$$

$$sec^2A = x^2 + \frac{1}{16x^2} + 2(x)\left(\frac{1}{4x}\right)$$

$$1 + tan^2A = x^2 + \frac{1}{16x^2} + \frac{1}{2}$$

$$tan^2A = x^2 + \frac{1}{16x^2} + \frac{1}{2} - 1$$

$$tan^2A = x^2 + \frac{1}{16x^2} - \frac{1}{2}$$

$$tan^2A = x^2 + \frac{1}{16x^2} - \frac{2x}{4x}$$

$$tan^2A = \left(x - \frac{1}{4x}\right)^2$$

$$tan\,A = x - \frac{1}{4x}$$

$$secA + tan\,A = x + \frac{1}{4x} + x - \frac{1}{4x}$$

$$secA + tan\,A = 2x$$

40) sec A = $x+\frac{1}{4x}$ ಆದರೆ sec A - tan A = $\frac{1}{2x}$ ಎಂದು ಸಾಧಿಸಿ.

sec A = $x+\frac{1}{4x}$

ವರ್ಗಗೊಳಿಸಿದಾಗ

$$sec^2A = \left(x+\frac{1}{4x}\right)^2$$

$$sec^2A = x^2 + \frac{1}{16x^2} + 2(x)(\frac{1}{4x})$$

$$1 + tan^2A = x^2 + \frac{1}{16x^2} + \frac{1}{2}$$

$$tan^2A = x^2 + \frac{1}{16x^2} + \frac{1}{2} - 1$$

$$tan^2A = x^2 + \frac{1}{16x^2} - \frac{1}{2}$$

$$tan^2A = x^2 + \frac{1}{16x^2} - \frac{2x}{4x}$$

$$tan^2A = \left(x-\frac{1}{4x}\right)^2$$

tan A = $x-\frac{1}{4x}$

sec A - tan A = $x+\frac{1}{4x}$ - $x+\frac{1}{4x}$

sec A - tan A = $\frac{2}{4x}$

sec A - tan A = $\frac{1}{2x}$

41) $cos^4A - sin^4A = 1 - sin^2A$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $cos^4A - sin^4A$

= $\left(cos^2A\right)^2 - \left(sin^2A\right)^2$

= $\left(cos^2A + sin^2A\right)\left(cos^2A - sin^2A\right)$

= $\left(cos^2A + sin^2A\right)\left(cos^2A - sin^2A\right)$

= 1 $\quad$ (1-$sin^2A - sin^2A$)

= $1 - sin^2A$

= RHS

42) $\frac{\cos\theta}{1-\tan\theta} + \frac{\sin\theta}{1-\cot\theta} = \sin\theta + \cos\theta$ ಎಂದು ಸಾಧಿಸಿ.

LHS $= \frac{\cos\theta}{1-\tan\theta} + \frac{\sin\theta}{1-\cot\theta}$

$= \frac{\cos\theta}{1-\frac{\sin\theta}{\cos\theta}} + \frac{\sin\theta}{1-\frac{\cos\theta}{\sin\theta}}$

$= \frac{\cos\theta}{\frac{\cos\theta-\sin\theta}{\cos\theta}} + \frac{\sin\theta}{\frac{\sin\theta-\cos\theta}{\sin\theta}}$

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

$= \frac{\cos^2\theta}{\cos\theta-\sin\theta} - \frac{\sin^2\theta}{\cos\theta-\sin\theta}$

$= \frac{\cos^2\theta-\sin^2\theta}{\cos\theta-\sin\theta}$

$= \frac{(\cos\theta+\sin\theta)(\cos\theta-\sin\theta)}{\cos\theta-\sin\theta}$

$= (\cos\theta+\sin\theta)$

= RHS

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43) $\frac{\tan\theta-\sin\theta}{\sin^3\theta} = \frac{\sec\theta}{1+\cos\theta}$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $\frac{\tan\theta-\sin\theta}{\sin^3\theta}$

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

$= \frac{\frac{\sin\theta(1-\cos\theta)}{\cos\theta}}{\sin^3\theta}$

$= \frac{1}{\sin^2\theta}\left[\frac{1-\cos\theta}{\cos\theta}\right]$

$= \frac{1}{1-\cos^2\theta}\left[\frac{1-\cos\theta}{\cos\theta}\right]$

$= \left[\frac{1-\cos\theta}{(1+\cos\theta)(1-\cos\theta)\cos\theta}\right]$

$= \left[\frac{1}{(1+\cos\theta)\cos\theta}\right]$

$= \frac{\sec\theta}{1+\cos\theta}$

= RHS

44) $sec^6A - tan^6A = 1 + 3tan^2Asec^2A$ ಎಂದು ಸಾಧಿಸಿ.

LHS = $sec^6A - tan^6A$

$= (sec^2A)^3 - tan^6A$

$= (1 + tan^2A)^3 - tan^6A$

$= 1 + tan^6A + 3\,tan^2A(1 + tan^2A) - tan^6A$

$= 1 + 3\,tan^2A(1 + tan^2A)$

$= 1 + 3tan^2Asec^2A$

= RHS

45) $\sqrt{\frac{1-\cos\theta}{1+\cos\theta}}$ = $\mathit{cosec}\,\theta - \cot\theta$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \sqrt{\frac{(1-\cos\theta)\times(1-\cos\theta)}{(1+\cos\theta)\times(1-\cos\theta)}}$$

$$= \sqrt{\frac{(1-\cos\theta)^2}{1-\cos^2\theta}}$$

$$= \sqrt{\frac{(1-\cos\theta)^2}{\sin^2\theta}}$$

$$= \frac{1-\cos\theta}{\sin\theta}$$

$$= \frac{1}{\sin\theta} - \frac{\cos\theta}{\sin\theta}$$

$$= \mathit{cosec}\,\theta - \cot\theta$$

$$= \text{RHS}$$

46) (1− cosecA)(1− secA)(1+ cosecA)(1+ cosA) = cosA ಎಂದು ಸಾಧಿಸಿ.

LHS =(1−cosecA)(1−secA)(1+cosecA)(1+cosA)=cosA

$= (1 - cosec^2 A)(1 - \frac{1}{\cos\theta})(1+\cos A)$

$= -cot^2 A(\frac{\cos A - 1}{\cos A})(1+\cos A)$

$= (-cot^2 A)(\frac{\cos^2 A - 1}{\cos A})$

$= \frac{(-cot^2 A) \text{x} (-sin^2 A)}{\cos A}$

$= \frac{\frac{\cos^2 A}{\sin^2 A} \text{ x } (\sin^2 A)}{\cos A}$

$= \cos A$

= RHS

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

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

$= \sin^2\theta + \cos^2\theta + \operatorname{cosec}^2\theta + \sec^2\theta + 2\sin\theta\frac{1}{\sin\theta} + 2\cos\theta\frac{1}{\cos\theta}$

$=1+1+\cot^2\theta+\tan^2\theta+1+2+2$

$= \tan^2\theta + \cot^2\theta + 7$

= RHS

48) $\frac{tan\,A+sec\,A-1}{tan\,A-sec\,A+1}$ = (1+sinA) secA ಎಂದು ಸಾಧಿಸಿ.

LHS = $\frac{tan\,A+sec\,A-1}{tan\,A-sec\,A+1}$

$= \frac{tan\,A + sec\,A - (sec^2A - tan^2A)}{tan\,A - sec\,A + 1}$

$= \frac{(tan\,A + sec\,A) - (secA + tanA)(secA - tanA)}{tan\,A - sec\,A + 1}$

$= \frac{(tan\,A + sec\,A)(1 - secA + tanA)}{tan\,A - sec\,A + 1}$

$= (tan\,A + sec\,A)$

$= \frac{sinA}{cos\,A} + \frac{1}{cos\,A}$

$= \frac{1+sin\,A}{cos\,A}$

= (1+sinA) secA

= RHS

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49) $\frac{\cos\theta}{1+\sin\theta}+\frac{1+\sin\theta}{\cos\theta}$ = 2secθ ಎಂದು ಸಾಧಿಸಿ.

$$LHS = \frac{\cos\theta}{1+\sin\theta}+\frac{1+\sin\theta}{\cos\theta}$$

$$= \frac{\cos^2\theta+(1+\sin\theta)^2}{\cos\theta(1+\sin\theta)}$$

$$= \frac{\cos^2\theta+1+\sin^2\theta+2\sin\theta}{\cos\theta(1+\sin\theta)}$$

$$= \frac{1+1+2\sin\theta}{\cos\theta(1+\sin\theta)}$$

$$= \frac{2+2\sin\theta}{\cos\theta(1+\sin\theta)}$$

$$= \frac{2(1+\sin\theta)}{\cos\theta(1+\sin\theta)}$$

$$= 2\sec\theta = RHS$$

50) $\frac{\cos\theta - \sin\theta + 1}{\cos\theta + \sin\theta - 1} = \operatorname{cosec}\theta + \cot\theta$ ಎಂದು ಸಾಧಿಸಿ.

$$\text{LHS} = \frac{\cos\theta - \sin\theta + 1}{\cos\theta + \sin\theta - 1}$$

$$= \frac{\frac{\cos\theta}{\sin\theta} - \frac{\sin\theta}{\sin\theta} + \frac{1}{\sin\theta}}{\frac{\cos\theta}{\sin\theta} + \frac{\sin\theta}{\sin\theta} - \frac{1}{\sin\theta}}$$

$$= \frac{\cot\theta - 1 + \operatorname{cosec}\theta}{\cot\theta + 1 - \operatorname{cosec}\theta}$$

$$= \frac{\cot\theta - (cosec^2\theta - cot^2\theta) + \operatorname{cosec}\theta}{\cot\theta + 1 - \operatorname{cosec}\theta}$$

$$= \frac{\cot\theta + \operatorname{cosec}\theta - [(\operatorname{cosec}\theta + cot\,\theta)(\operatorname{cosec}\theta - cot\,\theta)]}{\cot\theta + 1 - \operatorname{cosec}\theta}$$

$$= \frac{(\cot\theta + \operatorname{cosec}\theta)[1 - (\operatorname{cosec}\theta - cot\,\theta)]}{\cot\theta + 1 - \operatorname{cosec}\theta}$$

$$= \frac{(\cot\theta + \operatorname{cosec}\theta)(1 - \operatorname{cosec}\theta + cot\,\theta)}{\cot\theta + 1 - \operatorname{cosec}\theta}$$

$$= (\cot\theta + \operatorname{cosec}\theta)$$

$$= \text{RHS}$$

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ಎಸ್ ಹರ್ಷ & ಹೆಚ್.ಜಿ. ದೀಪಶ್ರೀ

ಧನ್ಯವಾದಗಳು

ಸರ್ಕಾರಿ ಪ್ರೌಢಶಾಲೆ, ಹೆಡತಲೆ, ನಂಜನಗೂಡು, ಮೈಸೂರು