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Under CSR Support by Foundation missiongyan

RIICO GROW WITH RAJASTHAN

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कक्षा-10 गणित | हिंदी माध्यम

ARJUN BATCH

त्रिकोणमिति का परिचय

अध्याय-8, भाग-9



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आज क्या पढेंगे ?



प्रश्नावली 8.3

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

हल :- LHS.

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

परिमेयकरण करने पर

$$\sqrt{\frac{1+\sin A}{1-\sin A} \times \frac{1+\sin A}{1+\sin A}}$$

$(a-b)(a+b) = a^2-b^2$

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

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

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

$\sin^2 A + \cos^2 A = 1$

$\cos^2 A = 1 - \sin^2 A$

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

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

LHS = RHS

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

$$= \sec A + \tan A$$

$$\left\{ \frac{1}{\cos A} = \sec A \right.$$

$$\left. \frac{\sin A}{\cos A} = \tan A \right\}$$

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प्रश्नावली 8.3

(vii) $\dfrac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta} = \tan\theta$

हल: LHS

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

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

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

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

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

$= \tan\theta\left[\dfrac{1 - 2 + 2\cos^2\theta}{2\cos^2\theta - 1}\right]$

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

$= \tan\theta \times 1$

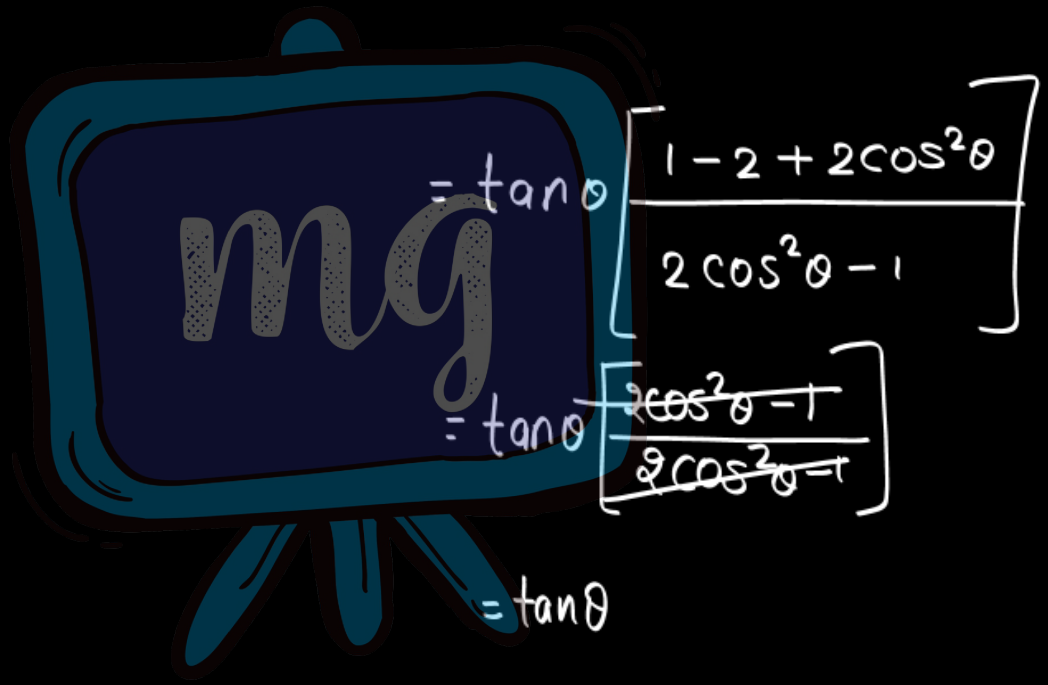
$= \tan\theta$

$= \text{RHS}$

$\therefore \text{LHS} = \text{RHS}$

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प्रश्नावली 8.3

(viii) $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2$

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

हल :- LHS.

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

$\{(a+b)^2 = a^2 + b^2 + 2ab\}$

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$= \sin^2A + \text{cosec}^2A + 2\sin A \,\text{cosec}A + \cos^2A + \sec^2A + 2\cos A \sec A$

$= (\sin^2A + \cos^2A) + \text{cosec}^2A + 2\sin A \times \frac{1}{\sin A} + \sec^2A$

$+ 2\cos A \frac{1}{\cos A}$

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

$1 + \tan^2A = \sec^2A$

$1 + \cot^2A = \text{cosec}^2A$

$= 5 + 1 + \cot^2A + 1 + \tan^2A$

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

LHS = RHS

"H.P."

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प्रश्नावली 8.3

(ix) $(\text{cosec}A - \sin A)(\sec A - \cos A) = \dfrac{1}{\tan A + \cot A}$

हल :- LHS

$= (\text{cosec}A - \sin A)(\sec A - \cos A)$

$= \left(\dfrac{1}{\sin A} - \dfrac{\sin A}{1}\right)\left(\dfrac{1}{\cos A} - \dfrac{\cos A}{1}\right)$

$= \left(\dfrac{1 - \sin^2 A}{\sin A}\right)\left(\dfrac{1 - \cos^2 A}{\cos A}\right)$

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$\sin^2A+\cos^2A=1$

$1-\sin^2A=\cos^2A$

$1-\cos^2A=\sin^2A$

LHS = RHS

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

$= \dfrac{\sin A\cos A}{1}$

RHS

$= \dfrac{1}{\tan A+\cot A}$

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

$= \dfrac{\cos^2A\times\sin^2A}{\sin A\times\cos A}$

$=\sin A\cos A$

प्रश्नावली 8.3

$\tan^2 A$

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

हल :-

M.-(I) $= \frac{1+\tan^2 A}{1+\cot^2 A}$

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

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$$\left(\frac{1-\tan A}{1-\cot A}\right)^2$$

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

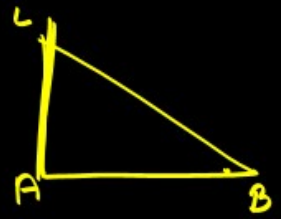
$$= \frac{(1-\tan A)^2}{\frac{(\tan A-1)^2}{\tan^2 A}}$$

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

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

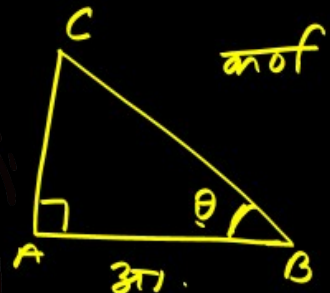
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$\sin 0^\circ = 0$

$\sin 90^\circ = 1$



लं.

0

$\sin 90^\circ = \frac{AC}{BC} = \frac{AC}{AC} = 1$

$\sin\theta = \frac{\text{लं.}}{\text{कर्ण}}$



$\sin\theta = \frac{AC}{BC} = \frac{0}{BC} = 0$

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