Trigonometric Identities Ex 6.1 Q69

Answer :

We know that, $\sin^2 A+\cos^2 A=1$

So have,

$$\begin{aligned}\sin^2 A\cos^2 B-\cos^2 A\sin^2 B&=\sin^2 A(1-\sin^2 B)-(1-\sin^2 A)\sin^2 B\\&=\sin^2 A-\sin^2 A\sin^2 B-\sin^2 B+\sin^2 A\sin^2 B\\&=\sin^2 A-\sin^2 B\end{aligned}$$

Hence proved.

Trigonometric Identities Ex 6.1 Q70

Answer :

We have to prove $\dfrac{\cot A+\tan B}{\cot B+\tan A}=\cot A\tan B$

Now,

$$\begin{aligned}\frac{\cot A+\tan B}{\cot B+\tan A}&=\frac{\cot A+\dfrac{1}{\cot B}}{\cot B+\dfrac{1}{\cot A}}\\&=\frac{\dfrac{\cot A\cot B+1}{\cot B}}{\dfrac{\cot A\cot B+1}{\cot A}}\\&=\frac{\cot A}{\cot B}\\&=\cot A\frac{1}{\cot B}\\&=\cot A\tan B\end{aligned}$$

Hence proved.

Trigonometric Identities Ex 6.1 Q71

Answer :

We have to prove $\frac{\tan A+\tan B}{\cot A+\cot B}=\tan A\tan B$

Now,

$$\frac{\tan A+\tan B}{\cot A+\cot B}=\frac{\tan A+\tan B}{\frac{1}{\tan A}+\frac{1}{\tan B}}$$
$$=\frac{\tan A+\tan B}{\frac{\tan B+\tan A}{\tan A\tan B}}$$
$$=\tan A\tan B$$

Hence proved.

Trigonometric Identities Ex 6.1 Q72

Answer :

We have to prove $\cot^2 A\operatorname{cosec}^2 B-\cot^2 B\operatorname{cosec}^2 A=\cot^2 A-\cot^2 B$

We know that, $\operatorname{cosec}^2 A-\cot^2 A=1$

So,

$$\cot^2 A\operatorname{cosec}^2 B-\cot^2 B\operatorname{cosec}^2 A=\cot^2 A(1+\cot^2 B)-\cot^2 B(1+\cot^2 A)$$
$$=\cot^2 A+\cot^2 A\cot^2 B-\cot^2 B-\cot^2 A\cot^2 B$$
$$=\cot^2 A-\cot^2 B$$

Hence proved.

********** END **********