Trigonometric Identities Ex 6.1 Q69

Answer:

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

So have,

$$\sin^2 A \cos^2 B - \cos^2 A \sin^2 B = \sin^2 A(1 - \sin^2 B) - (1 - \sin^2 A)\sin^2 B$$
$$= \sin^2 A - \sin^2 A \sin^2 B - \sin^2 B + \sin^2 A \sin^2 B$$
$$= \sin^2 A - \sin^2 B$$

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,

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

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

$$= \frac{\cot A}{\cot B}$$

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

$$= \cot A \tan B$$

Hence proved.

Trigonometric Identities Ex 6.1 Q71

Answer :

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

Now,

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

$$= \dfrac{\tan A + \tan B}{\dfrac{\tan B + \tan A}{\tan A \tan B}}$$

$$= \tan A \tan B$$

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 *********