Related Questions with Solutions

Questions

Quetion: 01

In cyclic quadrilateral $ABCD$, if $\cot A = \frac{3}{4}$ and $\tan B = \frac{-12}{5}$, then which of the following is(are) correct?

A. $\sin D = \frac{12}{13}$

B. $\sin(A + B) = \frac{16}{65}$

C. $\cos D = \frac{-5}{13}$

D. $\sin(C + D) = \frac{-16}{65}$

Solutions

Solution: 01

$\cot A = \frac{3}{4} \Rightarrow \cot(\pi - C) = \frac{3}{4} \Rightarrow \cot C = \frac{-3}{4}$

$\Rightarrow C$ is obtuse angle.

$\therefore \quad \sin C = \frac{4}{5}$ and $\cos C = \frac{-3}{5}$

$\tan B = \frac{-12}{5} \Rightarrow \tan D = \frac{12}{5}$

$\Rightarrow D$ is acute angle.

$\therefore \quad \sin D = \frac{12}{13}$ and $\cos D = \frac{5}{13}$

Hence, sin[C + D] = sin$C$. cos$D$ + cos$C$. sin$D$

$= \left(\frac{4}{5}\right)\left(\frac{5}{13}\right) + \left(\frac{-3}{5}\right)\left(\frac{12}{13}\right)$

$= \frac{20 - 36}{65} = \frac{-16}{65}$

Also, sin[A + B] = sin[2π – [C + D]]

$= -\sin(C + D) = \frac{16}{65}$

Correct Options

Answer:01

Correct Options: A, B, D