Related Questions with Solutions

Questions

Quetion: 01

The expression $\cos A \cos 2A \cos 4A \cos 8A \ldots \cos 2^{n-1}A$ equals

A. $\dfrac{2^n \sin A}{\sin 2^n A}$

B. $\dfrac{\sin 2^n A}{2^n \sin A}$

C. $\dfrac{2^n \sin 2^n A}{\sin A}$

D. $\dfrac{\sin A}{2^n \sin 2^n A}$

Solutions

Solution: 01

$$\cos 2^0 A \cos 2^1 A \cos 2^2 A \cos 2^3 A \ldots \cos 2^{n-1}A$$

$$= \frac{1}{2\sin A}\left(\sin 2A \cos 2A\right)\cos 2^2 A \cos 2^3 A \ldots \cos 2^{n-1}A$$

$$= \frac{1}{2^2 \sin A}\left(\sin 4A \cos 4A\right)\cos 2^3 A \ldots \cos 2^{n-1}A$$

$$= \frac{1}{2^3 \sin A}\left(2\sin 4A \cos 4A\right)\left(\cos 2^3 A\right)\ldots \cos 2^{n-1}A$$

Repeated the process n times, we have

$$= \frac{\sin 2^n A}{2^n \sin A}$$

Correct Options

Answer:01

Correct Options: B