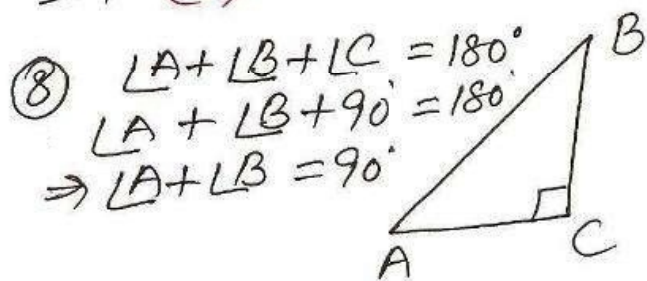


$$\begin{aligned}
 & \textcircled{6} \tan 1^\circ \tan 2^\circ \tan 3^\circ \dots \tan 89^\circ \\
 &= \tan 1^\circ \tan 89^\circ \tan 2^\circ \tan 88^\circ \dots \tan 45^\circ \\
 &= \cot(90^\circ - 1) \tan 89^\circ \cot(90^\circ - 2) \tan 88^\circ \dots \frac{\sin 45^\circ}{\cos 45^\circ} \\
 &= \cancel{\cot 89^\circ} \tan 89^\circ \cancel{\cot 88^\circ} \tan 88^\circ \dots \frac{\cos(90^\circ - 45)}{\cos 45^\circ} \left[\because \cot \theta = \frac{1}{\tan \theta} \right] \\
 &= 1 \times 1 \times \dots \times \frac{\cos 45^\circ}{\cos 45^\circ} \\
 &= 1 \quad \text{(B)}
 \end{aligned}$$

$$\begin{aligned}
 & \textcircled{7} \cos(9\alpha) = \sin \alpha \\
 &\Rightarrow \sin(90^\circ - 9\alpha) = \sin \alpha \\
 &\Rightarrow 90^\circ - 9\alpha = \alpha \\
 &\Rightarrow 10\alpha = 90^\circ \\
 &\Rightarrow \alpha = 9^\circ \\
 &\tan 5\alpha \\
 &= \tan 5 \times 9 \\
 &= \tan 45^\circ \\
 &= 1 \quad \text{(C)}
 \end{aligned}$$



$$\begin{aligned}
 & \cos(A+B) \\
 &= \cos 90^\circ \\
 &= 0 \quad \text{(A)}
 \end{aligned}$$

$$\begin{aligned}
 & \textcircled{9} \sin A + \sin^2 A = 1 \\
 &\Rightarrow \sin A = 1 - \sin^2 A \\
 &\Rightarrow \sin A = \cos^2 A \dots \textcircled{1} \\
 &\cos^2 A + \cos^4 A \\
 &= \cos^2 A (1 + \cos^2 A) \\
 &= \sin A (1 + \sin A) \\
 &= \sin A + \sin^2 A \\
 &= 1 \quad \text{(A)}
 \end{aligned}$$

$$\begin{aligned}
 & \textcircled{10} \sin \alpha = \frac{1}{2} \\
 &\Rightarrow \alpha = 30^\circ \left[\because \sin 30^\circ = \frac{1}{2} \right] \\
 &\cos \alpha = \frac{1}{2} \\
 &\Rightarrow \alpha = 60^\circ \left[\because \cos 60^\circ = \frac{1}{2} \right] \\
 &\alpha + \beta = 30^\circ + 60^\circ \\
 &= 90^\circ \quad \text{(D)}
 \end{aligned}$$