



Question 26:

$$\begin{aligned}
 & \frac{3 \tan 25^\circ \tan 40^\circ \tan 50^\circ \tan 65^\circ - \frac{1}{2} \tan^2 60^\circ}{4 (\cos^2 29^\circ + \cos^2 61^\circ)} \\
 &= \frac{3 \tan 25^\circ \tan 40^\circ \tan (90^\circ - 40^\circ) \tan (90^\circ - 25^\circ) - \frac{1}{2} \times (\sqrt{3})^2}{4 [\cos^2 29^\circ + \cos^2 (90^\circ - 29^\circ)]} \quad [\because \tan 60^\circ = \sqrt{3}] \\
 &= \frac{3 \tan 25^\circ \tan 40^\circ \cot 40^\circ \cot 25^\circ - \frac{3}{2}}{4 (\cos^2 29^\circ + \sin^2 29^\circ)} \quad [\because \cos^2 \theta + \sin^2 \theta = 1] \\
 &= \frac{3 \times \tan 25^\circ \times \tan 40^\circ \times \frac{1}{\tan 40^\circ} \times \frac{1}{\tan 25^\circ} - \frac{3}{2}}{4 \times 1} \\
 &= \frac{3 - \frac{3}{2}}{4} = \frac{3}{2} \times \frac{1}{4} = \frac{3}{8}
 \end{aligned}$$

Question 27:

$$\begin{aligned}
 & \frac{2}{3} \operatorname{cosec}^2 58^\circ - \frac{2}{3} \cot 58^\circ \tan 32^\circ \\
 & \quad - \frac{5}{3} \tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ \\
 &= \frac{2}{3} \operatorname{cosec}^2 58^\circ - \frac{2}{3} \cot 58^\circ \tan (90^\circ - 58^\circ) \\
 & \quad - \frac{5}{3} \tan 13^\circ \tan 37^\circ \times 1 \times \tan (90^\circ - 37^\circ) \tan (90^\circ - 13^\circ) \\
 &= \frac{2}{3} (\operatorname{cosec}^2 58^\circ - \cot^2 58^\circ) - \frac{5}{3} (\tan 13^\circ \cot 13^\circ) \times (\tan 37^\circ \cot 37^\circ) \\
 & \quad \left[ \text{But } \operatorname{cosec}^2 \theta - \cot^2 \theta = 1, \tan \theta \cot \theta = 1 \right] \\
 &= \frac{2}{3} \times 1 - \frac{5}{3} \times 1 \times 1 = \frac{2}{3} - \frac{5}{3} = -1
 \end{aligned}$$

\*\*\*\*\* END \*\*\*\*\*