



Question 7:

(i) LHS =

$$\begin{aligned} & \sin(70^\circ + \theta) - \cos(20^\circ - \theta) \\ &= \sin[90^\circ - (20^\circ - \theta)] - \cos(20^\circ - \theta) \\ &= \sin(90^\circ - \phi) - \cos \phi \text{ where } (20^\circ - \theta = \phi) \\ &= \cos \phi - \cos \phi = 0 \end{aligned}$$

= RHS

(ii) LHS =

$$\begin{aligned} & \tan(55^\circ - \theta) - \cot(35^\circ + \theta) \\ &= \tan[90^\circ - (35^\circ + \theta)] - \cot(35^\circ + \theta) \\ &= \tan(90^\circ - \phi) - \cot \phi \text{ where } (35^\circ + \theta) = \phi \\ &= \cot \phi - \cot \phi \end{aligned}$$

= RHS

(iii) LHS =

$$\begin{aligned} & \operatorname{cosec}(67^\circ + \theta) - \sec(23^\circ - \theta) \\ &= \operatorname{cosec}(90^\circ - \phi) - \sec \phi \text{ where } 23^\circ - \theta = \phi \\ &= \sec \phi - \sec \phi = 0 \end{aligned}$$

= RHS

$$\begin{aligned} \text{(iv) LHS} &= \operatorname{cosec}(65^\circ + \theta) - \sec(25^\circ - \theta) - \tan(55^\circ - \theta) + \cot(35^\circ + \theta) \\ &= \operatorname{cosec}[90^\circ - (25^\circ - \theta)] - \sec(25^\circ - \theta) \\ &\quad - \tan[90^\circ - (35^\circ + \theta)] + \cot(35^\circ + \theta) \\ &= \sec(25^\circ - \theta) - \sec(25^\circ - \theta) - \cot(35^\circ + \theta) + \cot(35^\circ + \theta) \\ &= 0 \end{aligned}$$

= RHS

(v) LHS =

$$\begin{aligned} & \sin(50^\circ + \theta) - \cos(40^\circ - \theta) + \tan 1^\circ \tan 10^\circ \tan 20^\circ \tan 70^\circ \\ &\quad \tan 80^\circ \tan 89^\circ \\ &= \sin[90^\circ - (40^\circ - \theta)] - \cos(40^\circ - \theta) + \tan 1^\circ \tan 10^\circ \tan 20^\circ \\ &\quad \tan(90^\circ - 20^\circ) \tan(90^\circ - 10^\circ) \tan(90^\circ - 1^\circ) \\ &= \cos(40^\circ - \theta) - \cos(40^\circ - \theta) + \tan 1^\circ \tan 10^\circ \\ &\quad \tan 20^\circ \cot 20^\circ \cot 10^\circ \cot 1^\circ \end{aligned}$$

$$= 0 + 1 = 1$$

= RHS

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