Question 4:
(i) LHS = cos81° - sin9°
= cos(90° -9°)- sin9° = sin9° - sin9°
= 0 = RHS
(ii) LHS = tan71° - cot19°
=tan(90° - 19°) – cot19° =cot19° - cot19°
=0 = RHS
(iii) LHS = cosec80° - sec10°
= cosec(90° - 10°) – sec(10°)
= sec10° - sec10° = 0
= RHS

(iv) LHS = $\operatorname{cosec}^2 72^\circ - \tan^2 18^\circ$

$= \operatorname{cosec}^2 (90^\circ - 18^\circ) - \tan^2 18^\circ$

$= \sec^2 18^\circ - \tan^2 18^\circ$

$= 1 + \tan^2 18^\circ - \tan^2 18^\circ$

$\left[\because 1 + \tan^2 18^\circ = \sec^2 18\right]$

$= 1 = RHS$

(v) $LHS = \cos^2 75^\circ + \cos^2 15^\circ$

$= \cos^2 (90^\circ - 15^\circ) + \cos^2 15$

$\left[\because \cos (90^\circ - \theta) = \sin \theta\right]$

$= \sin^2 15^\circ + \cos^2 15^\circ = 1 = RHS$

(vi) $LHS = \tan^2 66^\circ - \cot 24^\circ$

$= \tan^2 66^\circ - \cot^2 (90^\circ - 66^\circ)$

$\left[\because \cot (90^\circ - \theta) = \tan \theta\right]$

$= \tan^2 66^\circ - \tan^2 66^\circ = 0 = RHS$

$\therefore LHS = RHS$

(vii) $\sin^2 48^\circ + \sin^2 42^\circ$

$= \sin^2 48^\circ + \sin^2 (90^\circ - 48^\circ) = \sin^2 48^\circ + \cos^2 48^\circ$

$= 1 = RHS$

$\therefore$ LHS = RHS

(viii)

$LHS = \cos^2 75^\circ - \sin^2 33^\circ$

$= \cos^2 (90^\circ - 33^\circ) - \sin^2 33^\circ$

$= \sin^2 33^\circ - \sin^2 33^\circ = 0 = RHS$

(ix) LHS = (sin65° + cos25°) (sin65° - cos25°)

$= \sin^2 65^\circ - \cos^2 25^\circ$

$= \sin^2 65^\circ - \cos^2 (90^\circ - 65^\circ)$

$= \sin^2 65^\circ - \sin^2 65^\circ = 0 = RHS$

********** END **********