(11) $1 \cdot \cos\theta \cdot \sin(90^\circ - \theta) + \sin\theta \cos(90^\circ - \theta) = 1$

$\Rightarrow \cos\theta \cdot \cos\theta + \sin\theta \sin\theta = 1$

$\Rightarrow \cos^2\theta + \sin^2\theta = 1$

$\Rightarrow 1 = 1$ proved!!

(2) $\dfrac{\tan\theta}{\tan(90^\circ - \theta)} + \dfrac{\sin(90^\circ - \theta)}{\cos\theta} = \sec^2\theta$

$\Rightarrow \dfrac{\tan\theta}{\cot\theta} + \dfrac{\cancel{\cos\theta}}{\cancel{\cos\theta}} = \sec^2\theta$

$\Rightarrow \cancel{\sec^2\theta}\ \dfrac{\tan\theta}{1/\tan\theta} + 1 = \sec^2\theta$

$\Rightarrow \tan^2\theta + 1 = \sec^2\theta$

$\Rightarrow \sec^2\theta = \sec^2\theta$ proved

(3) $\dfrac{\cos(90^\circ - \theta)\cos\theta}{\tan\theta} + \cos^2(90^\circ - \theta) = 1$

$\Rightarrow \dfrac{\sin\theta\cos\theta}{\tan\theta} + \sin^2\theta = 1$

$\Rightarrow \dfrac{\sin\theta\cos\theta}{\frac{\sin\theta}{\cos\theta}} + \sin^2\theta = 1$

$\Rightarrow \frac{\sin\theta \cos\theta \cos\theta}{\sin\theta} + \sin^2\theta = 1$

$\Rightarrow \cos^2\theta + \sin^2\theta = 1$

$\Rightarrow 1 = 1$ proved

(4) $\sin(90° - \theta)\cos(90° - \theta) = \frac{\tan\theta}{1 + \tan^2\theta}$

$\Rightarrow \cos\theta \times \sin\theta = \frac{\sin\theta / \cos\theta}{1 + (\sin\theta/\cos\theta)^2}$

$\Rightarrow \cos\theta \times \sin\theta = \frac{\sin\theta}{\cos\theta} \times \cos^2\theta$

$\Rightarrow \cos\theta \times \sin\theta = \sin\theta \times \cos\theta$ proved

(12i) $(\sec A + \tan A)(1 - \sin A) = \cos A$

$\Rightarrow \sec A - \sec A \times \sin A + \tan A - \tan A \times \sin A$

$\Rightarrow \sec A - \frac{1}{\cos A} \times \sin A + \tan A - \frac{\sin A}{\cos A} \times \sin A$

$\Rightarrow \frac{1}{\cos A} - \frac{\sin A}{\cos A} + \frac{\sin A}{\cos A} - \frac{\sin^2 A}{\cos A}$

$\Rightarrow \frac{1 - \sin^2 A}{\cos A} \Rightarrow \frac{\cos^2 A}{\cos A}$

$\Rightarrow \cos A = \cos A$ proved!!

(ii) $(1 + \tan^2 A)(1 - \sin A)(1 + \sin A) = 1$

$\Rightarrow \sec^2 A (1 + \sin A - \sin A - \sin^2 A) = 1$

$\Rightarrow \sec^2 A (1 - \sin^2 A) = 1$

$\Rightarrow \sec^2 A \times \cos^2 A = 1$

$\Rightarrow \frac{1}{\cos^2 A} \times \cos^2 A = 1$

$= 1$

$\Rightarrow \quad 1 = 1$ proved!!

(13i) $\tan A + \cot A = \sec A \operatorname{cosec} A$

$\Rightarrow \dfrac{\sin A}{\cos A} + \dfrac{\cos A}{\sin A} = \sec A \operatorname{cosec} A$

$\Rightarrow \dfrac{\sin^2 A + \cos^2 A}{\cos A \sin A} = \sec A \operatorname{cosec} A$

$\Rightarrow \dfrac{1}{\frac{1}{\sec A} \times \frac{1}{\operatorname{cosec} A}} = \sec A \operatorname{cosec} A$

$\Rightarrow \sec A \operatorname{cosec} A = \sec A \operatorname{cosec} A$ proved!!

(ii) $(1 - \cos A)(1 + \sec A) = \tan A \sin A$

$\Rightarrow 1 + \sec A - \cos A - \cos A \sec A = \tan A \sin A$

$\Rightarrow (1 - \cos A)\left[1 + \dfrac{1}{\cos A}\right] = \tan A \sin A$

$\Rightarrow (1 - \cos A)\left[\dfrac{\cos A + 1}{\cos A}\right] = \tan A \sin A$

$\Rightarrow \dfrac{\cos A + 1 - \cos A - \cos^2 A}{\cos A} = \tan A \sin A$

$\Rightarrow \dfrac{1 - \cos^2 A}{\cos A} = \tan A \sin A$

$\Rightarrow \dfrac{\sin^2 A}{\cos A} \Rightarrow \dfrac{\sin A}{\cos A} \times \sin A = \tan A \sin A$

$\Rightarrow \tan A \times \sin A = \tan A \sin A$ proved!

(14i) $\dfrac{1}{1 + \cos A} + \dfrac{1}{1 - \cos A} = 2 \operatorname{cosec}^2 A$

$\Rightarrow \frac{1 - \cancel{\cos A} + 1 + \cancel{\cos A}}{1^2 - \cos^2 A} = 2\operatorname{cosec}^2 A$

$\Rightarrow \frac{2}{\sin^2 A} \Rightarrow \frac{2}{\frac{1}{\operatorname{cosec}^2 A}} = 2\operatorname{cosec}^2 A$

$\Rightarrow 2\operatorname{cosec}^2 A = 2\operatorname{cosec}^2 A$ proved!!

(ii) $\frac{1}{\sec A + \tan A} + \frac{1}{\sec A - \tan A} = 2\sec A$

$\Rightarrow \frac{\sec A - \tan A + \sec A + \tan A}{\sec^2 A - \tan^2 A} = 2\sec A$

$\Rightarrow \frac{2\sec A}{1} = 2\sec A$ proved!!

(15i) $\frac{\sin A}{1 + \cos A} = \frac{1 - \cos A}{\sin A}$

$\Rightarrow \frac{\sin A}{1 + \cos A} \times \frac{1 - \cos A}{1 - \cos A} = \frac{1 - \cos A}{\sin A}$

$\Rightarrow \frac{\sin A (1 - \cos A)}{1^2 - \cos^2 A} = \frac{1 - \cos A}{\sin A}$

$\Rightarrow \frac{\cancel{\sin A}(1 - \cos A)}{\sin^{\cancel{2}} A} = \frac{1 - \cos A}{\sin A}$

$\Rightarrow \frac{1 - \cos A}{\sin A} = \frac{1 - \cos A}{\sin A}$ proved!!

(ii) $\frac{1 - \tan^2 A}{\cot^2 A - 1} = \tan^2 A$

$\Rightarrow \frac{1 - \frac{1}{\cot^2 A}}{\cot^2 A - 1} = \tan^2 A$

$\Rightarrow \frac{\frac{\cot^2 A - 1}{\cot^2 A}}{\cot^2 A - 1} = \tan^2 A$

$\Rightarrow \frac{\cot^2 A - 1}{\cot^2 A} \times \frac{1}{\cot^2 A - 1} = \tan^2 A$

$\Rightarrow \frac{1}{\cot^2 A} = \tan^2 A$

$\Rightarrow \tan^2 A = \tan^2 A$ proved!!

(iii) $\frac{\sin A}{1 + \cos A} = \operatorname{cosec} A - \cot A$

$\Rightarrow \frac{\sin A}{1 + \cos A} \times \frac{1 - \cos A}{1 - \cos A} = \operatorname{cosec} A - \cot A$

$\Rightarrow \frac{\sin A (1 - \cos A)}{1^2 - \cos^2 A} = \operatorname{cosec} A - \cot A$

$\Rightarrow \frac{\sin A (1 - \cos A)}{\sin^2 A} = \operatorname{cosec} A - \cot A$

$= \frac{1 - \cos A}{\sin A} = \operatorname{cosec} A - \cot A$