

NCERT Maths Solutions by Dev Anoop (Bathinda) Ex 8.3

$$1 \text{ (i)} \quad \frac{\sin 18^\circ}{\cos 72^\circ}$$

$$= \frac{\cos(90^\circ - 18^\circ)}{\cos 72^\circ}$$

$$= \frac{\cancel{\cos 72^\circ}}{\cancel{\cos 72^\circ}}$$

$$= 1$$

$$1 \text{ (ii)} \quad \frac{\tan 26^\circ}{\cot 64^\circ}$$

$$= \frac{\cot(90^\circ - 26^\circ)}{\cot 64^\circ}$$

$$= \frac{\cancel{\cot 64^\circ}}{\cancel{\cot 64^\circ}}$$

$$= 1$$

$$1 \text{ (iii)} \quad \cos 48^\circ - \sin 42^\circ$$

$$= \sin(90^\circ - 48^\circ) - \sin 42^\circ$$

$$= \sin 42^\circ - \sin 42^\circ$$

$$= 0$$

$$2 \text{ (i)} \quad \overset{\text{LHS}}{=} \tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ$$

$$= \tan 48^\circ \tan 42^\circ \tan 23^\circ \tan 67^\circ$$

$$= \cot(90^\circ - 48^\circ) \tan 42^\circ \cot(90^\circ - 23^\circ) \tan 67^\circ$$

$$= \cancel{\cot 42^\circ} \tan 42^\circ \tan 67^\circ \cancel{\cot 67^\circ}$$

$$= 1$$

$$= \text{RHS}$$

[cot $\theta = \frac{1}{\tan \theta}$]

$$\overset{\text{LHS}}{=} 2 \text{ (ii)} = \cos 38^\circ \cos 52^\circ - \sin 38^\circ \sin 52^\circ$$

$$= \sin(90^\circ - 38^\circ) \sin(90^\circ - 52^\circ) - \sin 38^\circ \sin 52^\circ$$

$$= \sin 52^\circ \sin 38^\circ - \sin 38^\circ \sin 52^\circ$$

$$= 0$$

$$= \text{RHS}$$

$$3 \quad \tan 2A = \cot(A - 18^\circ)$$

$$\Rightarrow \cot(90^\circ - 2A) = \cot(A - 18^\circ)$$

$$\Rightarrow 90^\circ - 2A = A - 18^\circ$$

$$\Rightarrow -3A = -108$$

$$\Rightarrow A = 36^\circ$$

$$4 \quad \tan A = \cot B$$

$$\Rightarrow \cot(90^\circ - A) = \cot B$$

$$\Rightarrow 90^\circ - A = B$$

$$\Rightarrow A + B = 90^\circ$$

$$5 \quad \sec 4A = \operatorname{cosec}(A - 20^\circ)$$

$$\Rightarrow \operatorname{cosec}(90^\circ - 4A) = \operatorname{cosec}(A - 20^\circ)$$

$$\Rightarrow 90^\circ - 4A = A - 20^\circ$$

$$\Rightarrow -5A = -110$$

$$\Rightarrow A = 22^\circ$$

$$6 \quad A + B + C = 180^\circ$$

$$\Rightarrow B + C = 180^\circ - A$$

$$\Rightarrow \frac{B+C}{2} = 90^\circ - \frac{A}{2} \dots \text{ (1)}$$

$$\text{LHS} = \sin\left(\frac{B+C}{2}\right)$$

$$= \sin\left(90^\circ - \frac{A}{2}\right) \text{ (use i)}$$

$$= \cos \frac{A}{2}$$

$$= \text{RHS}$$

$$7 \quad \sin 67^\circ + \cos 75^\circ$$

$$= \cos(90^\circ - 67^\circ) + \sin(90^\circ - 75^\circ)$$

$$= \cos 23^\circ + \sin 15^\circ$$