

Q: (2) Find the value of following: (निम्न का मान ज्ञात करें):

Sol: (a)  $\sec(-225^\circ)$  (b)  $\tan 75^\circ$

$$\begin{aligned} \text{(a) } \sec(-225^\circ) &= \sec 225^\circ \quad \{\because \sec(-\theta) = \sec \theta\} \\ &= \sec(2 \times 90^\circ + 45^\circ) \\ &= -\sec 45^\circ \\ &= -(\sqrt{2}) \quad \{\because \sec 45^\circ = \sqrt{2}\} \\ &= -\sqrt{2} \quad \underline{\underline{\text{Ans}}} \end{aligned}$$

$$\begin{aligned} \text{(b) } \tan 75^\circ &= \tan(30^\circ + 45^\circ) \\ &= \frac{\tan 30^\circ + \tan 45^\circ}{1 - \tan 30^\circ \tan 45^\circ} \quad \left[ \because \tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B} \right] \\ &= \frac{\frac{1}{\sqrt{3}} + 1}{1 - \frac{1}{\sqrt{3}} \cdot 1} \\ &= \frac{1 + \sqrt{3}}{\sqrt{3} - 1} \\ &= \frac{(1 + \sqrt{3})^2}{(\sqrt{3})^2 - (1)^2} \quad \text{By rationalization} \\ &= \frac{1 + 3 + 2\sqrt{3}}{3 - 1} \\ &= \frac{4 + 2\sqrt{3}}{2} \\ &= 2 + \sqrt{3} \quad \underline{\underline{\text{Ans}}} \end{aligned}$$

the following: (निम्न को हल करो):

$$\tan^2 \theta = 1$$

$$(b) \sin 2\theta = -1$$

$$3 \tan \theta = 1$$

$$\sin 2\theta = -1$$

$$\tan \theta = 1/3$$

$$\sin 2\theta = \sin(-\frac{\pi}{2})$$

$$\tan \theta = \pm \frac{1}{\sqrt{3}}$$

$$2\theta = n\pi + (-1)^n(-\frac{\pi}{2})$$

$$\tan \theta = \pm \tan \frac{\pi}{6}$$

$$2\theta = n\pi - (-1)^n \frac{\pi}{2}$$

$$\theta = n\pi \pm \frac{\pi}{6}$$

$$\theta = \frac{n\pi}{2} - (-1)^n \frac{\pi}{4} \quad \underline{\underline{\text{Ans}}}$$

$$\Rightarrow \theta = n\pi \pm \frac{\pi}{6} \quad \underline{\underline{\text{Ans}}}$$

Q: 3 Prove that (सिद्ध कीजिए):

$$(a) \cos 28^\circ - \cos 32^\circ = \sin 2^\circ$$

$$(b) \cot \theta - \tan \theta = 2 \cot 2\theta$$

Sol: LHS,  $\cos 28^\circ - \cos 32^\circ$

LHS,  $\cot \theta - \tan \theta$

$$= -2 \sin \left( \frac{28+32}{2} \right) \sin \left( \frac{28-32}{2} \right)$$

$$= \frac{1}{\tan \theta} - \tan \theta$$

$$= -2 \sin \left( \frac{60}{2} \right) \sin \left( -\frac{4}{2} \right)$$

$$= \frac{1 - \tan^2 \theta}{\tan \theta}$$

$$= -2 \sin 30^\circ \sin(-2^\circ)$$

$$= \frac{2(1 - \tan^2 \theta)}{2 \tan \theta}$$

$$= -2 \left( \frac{1}{2} \right) \cdot \{-\sin 2^\circ\}$$

$$= 2 \left[ \frac{1}{\frac{2 + \tan \theta}{1 - \tan \theta}} \right]$$

$$= + \sin 2^\circ$$

$$= 2 \left[ \frac{1}{\tan 2\theta} \right]$$

$$= \sin 2^\circ$$

$$= 2 \cot 2\theta$$

$$= \underline{\underline{\text{RHS}}}$$

$$= \underline{\underline{\text{R.H.S.}}}$$

H.P

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