Ex#10.1

Q1:-

i) $\sin(-780^\circ)$

$= -\sin 780^\circ$ even

$= -\sin(8\times 90^\circ + 60^\circ)$

$= -\sin 60^\circ$

$= -\dfrac{\sqrt{3}}{2}$

ii) $\cot(-855^\circ)$

$= -\cot 855^\circ$ odd

$= -\cot(9\times 90^\circ + 45^\circ)$

$= -(-\tan 45^\circ)$

$= \tan 45^\circ$

$= 1$

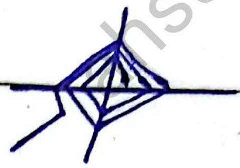
iii) $\csc 2040^\circ$

$= \csc(22\times 90^\circ + 60^\circ)$

$= -\csc 60^\circ$

$= -\dfrac{2}{\sqrt{3}}$

iv) $\sec(-960^\circ)$



$= \sec 960^\circ$

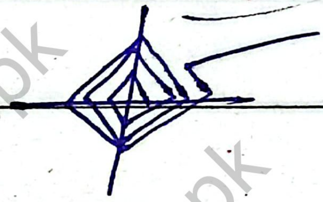
$= \sec(10\times 90^\circ + 60^\circ)$

$= -\sec 60^\circ$

$= -\frac{2}{1}$

$= -2$

v) $\tan 1110^\circ$

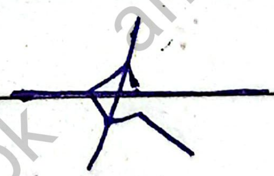


$= \tan(12\times 90^\circ + 30^\circ)$

$= \tan 30^\circ$

$= \frac{1}{\sqrt{3}}$

vi) $\sin(-300^\circ)$



$= -\sin 300^\circ$

$= -\sin(3\times 90^\circ + 30^\circ)$

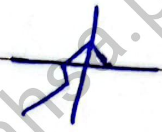
$= -(-\sin 30^\circ)$

$= \sin 30^\circ$

$= \frac{1}{2}$

Q2.-

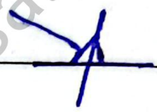
i) $\sin 196^\circ$



$= \sin(2\times 90^\circ + 16^\circ)$

$= -\sin 16^\circ$

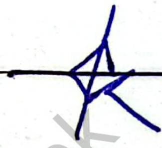
ii) $\cos 147^\circ$



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

$= -\cos 33^\circ$

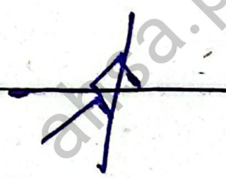
iii) $\sin 319^\circ$



$= \sin(4\times 90^\circ - 41^\circ)$

$= -\sin 41^\circ$

iv) $\cos 254^\circ$

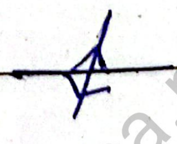


odd

$= \cos(3\times 90^\circ - 16^\circ)$

$= -\sin 16^\circ$

v) $\tan 294^\circ$



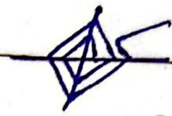
$= \tan(3\times 90^\circ + 24^\circ)$

$= -\cot 24^\circ$

vi) $\cos 728^\circ$

$= \cos(8\times 90^\circ + 8^\circ)$

$= \cos 8^\circ$



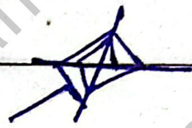
vii) $\sin(-625^\circ)$

$= -\sin 625^\circ$

$= -\sin(7\times 90^\circ - 5^\circ)$

$= -(-\cos 5^\circ)$

$= \cos 5^\circ$



viii) $\cos(-435^\circ)$

$= \cos 435^\circ$

$= \cos(5\times 90^\circ - 15^\circ)$

$= \sin 15^\circ$

ix) $\sin 150^\circ$

$= \sin(2\times 90^\circ - 30^\circ)$

$= \sin 30^\circ$

Q3:-

i) $\sin(180^\circ+\alpha)\sin(90^\circ-\alpha) = -\sin\alpha\cos\alpha$

L.H.S.

$= \sin(180^\circ+\alpha)\sin(90^\circ-\alpha)$

$= \sin(2\times 90^\circ+\alpha)\sin(1\times 90^\circ-\alpha)$

$= -\sin\alpha\cos\alpha$

$=$ R.H.S.

ii) L.H.S.

$= \sin 780^\circ \sin 480^\circ + \cos 120^\circ \sin 30^\circ$

$= \sin(8\times 90^\circ+60^\circ)\sin(5\times 90^\circ+30^\circ)+\cos(1\times 90^\circ+30^\circ)\sin 30^\circ$

$= \sin 60^\circ \cos 30^\circ + (-\sin 30^\circ)\sin 30^\circ$

$= \frac{\sqrt{3}}{2}\times\frac{\sqrt{3}}{2} - \frac{1}{2}\times\frac{1}{2}$

$= \frac{3}{4} - \frac{1}{4}$

$= \frac{2}{4}$

$= \frac{1}{2}$

$=$ R.H.S.

iii) L.H.S.

$= \cos 306^\circ + \cos 234^\circ + \cos 162^\circ + \cos 18^\circ$

$= \cos(3\times 90^\circ + 36^\circ) + \cos(3\times 90^\circ - 36^\circ)$
$\quad + \cos(2\times 90^\circ - 18^\circ) + \cos 18^\circ$

$= \cancel{+\sin 36^\circ} - \cancel{\sin 36^\circ} - \cancel{\cos 18^\circ} + \cancel{\cos 18^\circ}$

$= 0$

$=$ R.H.S.

iv) L.H.S.

$= \cos 330^\circ \sin 600^\circ + \cos 120^\circ \sin 150^\circ$

$= \cos(3\times 90^\circ + 60^\circ)\sin(6\times 90^\circ + 60^\circ) + \cos(2\times 90^\circ - 60^\circ)$
$\quad \sin(2\times 90^\circ - 30^\circ)$

$= \sin 60^\circ(-\sin 60^\circ) + (-\cos 60^\circ)\sin 30^\circ$

$= -\frac{\sqrt{3}}{2}\times\frac{\sqrt{3}}{2} - \frac{1}{2}\times\frac{1}{2}$

$= -\frac{3}{4} - \frac{1}{4}$

$= \frac{-4}{4} = -1$

$=$ R.H.S.

Mon Tue Wed Thu Fri Sat

تاریخ: ____

GO with this

$\frac{\pi}{2}$: $\frac{\pi}{2}+\theta$, $\frac{\pi}{2}-\theta$, $2\pi+\theta$

π: $\pi-\theta$, $\pi+\theta$ | 2π

$\frac{3\pi}{2}$: $\frac{3\pi}{2}-\theta$, $\frac{3\pi}{2}+\theta$, $2\pi-\theta$

Q11:-

8) L.H.S.

$$= \frac{\sin^2(\overset{III}{\pi+\theta})\tan(\overset{IV}{\frac{3\pi}{2}+\theta})}{\cot^2(\overset{III}{\frac{3\pi}{2}-\theta})\cos^2(\overset{II}{\pi-\theta})\operatorname{cosec}(\overset{IV}{2\pi-\theta})}$$

NO More please

$$= \frac{\sin^2(180^\circ+\theta)\tan(270^\circ+\theta)}{\cot^2(270^\circ-\theta)\cos^2(180^\circ-\theta)\operatorname{cosec}(360^\circ-\theta)}$$

$$= \frac{(-\sin\theta)^2(-\cot\theta)}{\tan^2\theta\,(-\cos\theta)^2\,(-\operatorname{cosec}\theta)}$$

$$= \frac{\cancel{\sin^2\theta}\left(-\frac{\cos\theta}{\cancel{\sin\theta}}\right)}{\cancel{\tan}\,\frac{\cancel{\sin^2\theta}}{\cancel{\cos^2\theta}}\times\cancel{\cos^2\theta}\left(\frac{-1}{\cancel{\sin\theta}}\right)}$$

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

$$= \cos\theta$$

$$= R.H.S.$$

iii) L.H.S.

$$= \frac{\cos(90^\circ+\theta)\sec(-\theta)\tan(180^\circ-\theta)}{\sec(360^\circ-\theta)\sin(180^\circ+\theta)\cot(90^\circ-\theta)}$$

$$= \frac{\cos(1\times 90^\circ+\theta)\sec\theta\tan(2\times 90^\circ-\theta)}{\sec(4\times 90^\circ-\theta)\sin(2\times 90^\circ+\theta)\cot(1\times 90^\circ-\theta)}$$

$$= \frac{-\sin\theta\sec\theta(-\tan\theta)}{\sec\theta(-\sin\theta)\tan\theta}$$

$$= \frac{+\sin\theta\times\frac{1}{\cos\theta}\times\frac{\sin\theta}{\cos\theta}}{\frac{1}{\cos\theta}\times\sin\theta\times\frac{\sin\theta}{\cos\theta}}$$

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

$$= -1$$

$$= R.H.S$$

Q5:-

i) $\sin(\alpha+\beta) = \sin\gamma$

As,

$$\alpha+\beta+\gamma = 180^\circ$$

$$\alpha+\beta = 180^\circ-\gamma$$

Taking 'sin' —

$$\sin(\alpha+\beta) = \sin(180^\circ-\gamma)$$

$$\sin(\alpha+\beta) = \sin(2\times 90^\circ-\gamma)$$

$$\sin(\alpha+\beta) = \sin\gamma$$

Hence Proved

ii) $\cos\left(\frac{\alpha+\beta}{2}\right) = \sin\frac{\gamma}{2}$

As, $\alpha+\beta+\gamma = 180^\circ$

$$\alpha+\beta = 180^\circ-\gamma$$

Divided by '2'.

$$\frac{\alpha+\beta}{2} = \frac{180^\circ-\gamma}{2}$$

$$\frac{\alpha+\beta}{2} = 90^\circ-\frac{\gamma}{2}$$

Taking cos

$$\cos\left(\frac{\alpha+\beta}{2}\right) = \cancel{\cos}\left(1\times 90^\circ - \frac{\gamma}{2}\right)$$

$$\cos\left(\frac{\alpha+\beta}{2}\right) = \cancel{\sin}\frac{\gamma}{2}$$

Hence Proved

iii) $\cos(\alpha+\beta) = -\cos\gamma$

As,

$$\alpha+\beta+\gamma = 180^\circ$$

$$\alpha+\beta = 180^\circ - \gamma$$

Taking cos

$$\cos(\alpha+\beta) = \cos(180^\circ - \gamma)$$

$$\cos(\alpha+\beta) = \cos(2\times 90^\circ - \gamma)$$

$$\cos(\alpha+\beta) = -\cos\gamma$$

Hence Proved

iv) $\tan(\alpha+\beta)+\tan\gamma=0$

As,

$$\alpha+\beta+\gamma=180^\circ$$

$$\alpha+\beta=180^\circ-\gamma$$

Taking tan

$$\tan(\alpha+\beta)=\tan(2\times 90^\circ-\gamma)$$

$$\tan(\alpha+\beta)=-\tan\gamma$$

$$\tan(\alpha+\beta)+\tan\gamma=0$$

Hence Proved