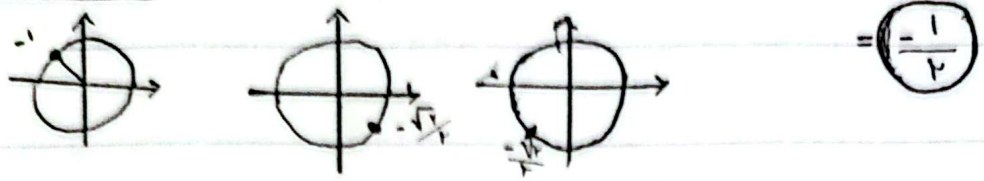


الف) $\tan \frac{11\pi}{2} + \sin \frac{15\pi}{2} \cos \frac{13\pi}{2}$

سوال 1

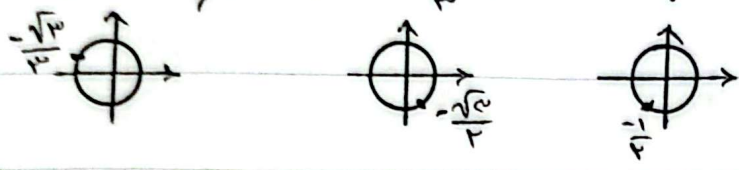
$$\tan \left(2\pi + \frac{3\pi}{2} \right) + \sin \left(4\pi - \frac{\pi}{2} \right) \cos \left(2\pi + \frac{5\pi}{2} \right) = (-1) + \left(-\frac{\sqrt{2}}{2} \right) \left(-\frac{\sqrt{2}}{2} \right) = -1 + \frac{1}{2}$$



$$= \left(-\frac{1}{2} \right)$$

ب) $\tan \frac{14\pi}{3} \sin \frac{11\pi}{6} + \cos \frac{10\pi}{3}$

$$\tan \left(3\pi - \frac{\pi}{3} \right) \sin \left(2\pi + \frac{5\pi}{6} \right) + \cos \left(3\pi + \frac{\pi}{3} \right) = \left(-\frac{\sqrt{3}}{3} \right) \left(-\frac{\sqrt{2}}{2} \right) + \left(-\frac{1}{2} \right)$$



$$= \frac{\sqrt{3}}{6} - \frac{\sqrt{3}}{6} = 0$$

$\cot x = 2 \rightarrow \frac{2\cos x - \sin x}{\cos x + \sin x} = ?$

سوال 2

$$\frac{2\cos x}{\sin x} - \frac{\sin x}{\sin x} = \frac{2-1}{2+1} = \frac{1}{3}$$

$\sin \alpha = 2\cos \alpha, \text{ where } \Rightarrow \cos \alpha = ?$

سوال 3

$$\sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow (2\cos \alpha)^2 + \cos^2 \alpha = 1 \Rightarrow 4\cos^2 \alpha + \cos^2 \alpha = 1$$

$$\Rightarrow \cos^2 \alpha = \frac{1}{5} \Rightarrow \cos \alpha = \pm \frac{\sqrt{5}}{5} \Rightarrow 2\cos \alpha = \frac{2\sqrt{5}}{5}$$

$$\cos \left(2\pi + \frac{3\pi}{2} \right) = \left(\frac{3\pi}{2} + \alpha \right)$$

الف) $\frac{2\cos \alpha}{\sin \alpha} = \frac{\sqrt{2}}{1} \Rightarrow \cos \left(\frac{11\pi}{2} + \alpha \right) = ?$

سوال 4

$\sin \alpha > 0, \cos \alpha < 0$
 $\sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow \left(\frac{\sqrt{2}}{2} \right)^2 + \cos^2 \alpha = 1$

$$\Rightarrow \cos^2 \alpha = \frac{1}{2} - \frac{1}{2} = 0 \Rightarrow \cos \alpha = 0$$

$$\cos \left(\frac{11\pi}{2} + \alpha \right) = \cos \frac{11\pi}{2} \cos \alpha - \sin \frac{11\pi}{2} \sin \alpha = \frac{0}{1} - \frac{1}{1} = -1 = \left(-\frac{1}{1} \right)$$

کمر کا پرچہ

ب) دیا ہے ، $\tan \alpha = \frac{1}{V} \Rightarrow \sin\left(\frac{2\pi}{\lambda} + \alpha\right) = ?$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow \left(1 + \frac{1}{V^2}\right) = \frac{1}{\cos^2 \alpha} \Rightarrow \frac{1}{\cos \alpha} = \frac{d\sqrt{r}}{V} \quad \sin\left(\frac{2\pi}{\lambda} + \alpha\right) \quad \cos \alpha = \frac{V}{\sqrt{V^2 + 1}} = \frac{V\sqrt{r}}{1}$$

$$\sin\left(\frac{2\pi}{\lambda} + \alpha\right) = \sin \frac{2\pi}{\lambda} \cos \alpha + \cos \frac{2\pi}{\lambda} \sin \alpha = \frac{-\sqrt{r}}{V} \cos \alpha - \frac{\sqrt{r}}{V} \sin \alpha$$

$$= -\frac{\sqrt{r}}{V} (\cos \alpha + \sin \alpha)$$

① $\cos \alpha = \frac{V\sqrt{r}}{1}$

② $\sin \alpha = \tan \alpha \cdot \cos \alpha = \frac{1}{V} \times \frac{V\sqrt{r}}{1} = \frac{\sqrt{r}}{1}$

$$\Rightarrow -\frac{\sqrt{r}}{V} \left(\frac{V\sqrt{r}}{1} + \frac{\sqrt{r}}{1} \right) = -\frac{\sqrt{r}}{V} \times \frac{\lambda\sqrt{r}}{2} = \frac{-\lambda}{2}$$

سوال ۱۰

$\tan \alpha = ?$

$$r \sin^2 \alpha + \cos^2 \alpha = \frac{\lambda}{2}$$

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

$$\sin^2 \alpha = \frac{\lambda}{2} - 1 = \frac{1}{2}$$

$$\frac{1}{2} + \cos^2 \alpha = 1 \Rightarrow \cos^2 \alpha = \frac{1}{2} - \frac{1}{2} = 0$$

$$\tan^2 \alpha = \frac{\sin^2 \alpha}{\cos^2 \alpha} = \frac{\frac{1}{2}}{0} = \frac{1}{0}$$

$\sqrt{r}, \gamma, \alpha$ λ, δ $\frac{\text{max}}{\text{min}}$

سوال ۱۱

$$\lambda, \delta = \frac{1}{r} a b \sin \alpha \Rightarrow \frac{1}{r} \times \sqrt{r} \times \gamma \times \sin \alpha \Rightarrow \lambda, \delta = \sqrt{r} \sin \alpha$$

$$\sin \alpha = \frac{\lambda, \delta}{\sqrt{r}} = \frac{10/10 \sqrt{r}}{\sqrt{r}} = \frac{\sqrt{r}}{r} \Rightarrow 0 < \alpha < 180^\circ$$

$\frac{\pi}{4} \rightarrow 45^\circ$ $\frac{3\pi}{4} \rightarrow 135^\circ$
min max

$$\frac{10}{40} = \frac{1}{4} \Rightarrow \frac{\sqrt{r}}{r} = \frac{1}{4} \Rightarrow \frac{\sqrt{r}}{r} = \frac{1}{4}$$

سوال ۷

$$s = \Delta \quad \frac{a}{b} = \frac{r}{r}$$

مسئله ۱۰۰ - ۲۰

سوال ۷

$$\Delta = ab \sin \alpha \Rightarrow \Delta = ab (\sin \alpha)$$

$$\sin(180^\circ - 30^\circ) = \sin(30^\circ) = \frac{1}{2}$$

$$\Delta = ab \frac{1}{2} \Rightarrow ab = \Delta \times 2 \Rightarrow ab = 10 \times 2$$

$$a = \frac{r}{r} b \Rightarrow \left(\frac{r}{r} b\right)(b) = 10 \times 2 \Rightarrow \frac{r}{r} b^2 = 10 \times 2 \Rightarrow b^2 = 10 \times 2 \times \frac{r}{r} \Rightarrow b^2 = 20 \times \frac{r}{r} \Rightarrow b^2 = 20$$

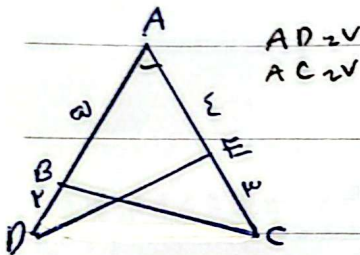
$$b = 2\sqrt{5}$$

$$a = \frac{r}{r} (2\sqrt{5}) \Rightarrow a = 4\sqrt{5}$$

$$P = r(a+b) = r(4\sqrt{5} + 2\sqrt{5}) = 10\sqrt{5}$$

$$S_{ABC} - S_{ADE} = 1, \sqrt{2} \quad \tan A = ?$$

سوال ۱۰



$$AD = 2$$

$$AC = 2$$

$$S_{(ABC)} - S_{(ADE)} = 1, \sqrt{2} \quad 0 < A < 90^\circ$$

$$S = \frac{1}{2} ab \sin A$$

$$S_{(ABC)} = \frac{1}{2} (AB)(AC) \sin A = \frac{1}{2} \times 2 \times 2 \sin A = 2 \sin A$$

$$S_{(ADE)} = \frac{1}{2} (AD)(AE) \sin A = \frac{1}{2} \times 1 \times 1 \sin A = \frac{1}{2} \sin A$$

$$(2 \sin A) - \left(\frac{1}{2} \sin A\right) = 1, \sqrt{2} \Rightarrow \frac{3}{2} \sin A = 1, \sqrt{2}$$

$$\sin A = \frac{1, \sqrt{2}}{\frac{3}{2}} = \frac{2}{3} \sqrt{2}$$

$$\sin^2 A + \cos^2 A = 1 \Rightarrow \left(\frac{2}{3} \sqrt{2}\right)^2 + \cos^2 A = 1 \Rightarrow \frac{8}{9} + \cos^2 A = 1 \Rightarrow \cos^2 A = \frac{1}{9} \Rightarrow \cos A = \frac{1}{3}$$

$$\tan A = \frac{\frac{2}{3} \sqrt{2}}{\frac{1}{3}} = \frac{2\sqrt{2}}{1} = 2\sqrt{2}$$

$$AB \sim M, BS \sim N$$

$$\overline{BN} = \overline{NC} \\ \Rightarrow \frac{BN}{NC} = \frac{1}{1}$$

$$S(ABC) = \frac{1}{2} (BM \times BN) \quad \text{قال}$$

$$\Rightarrow BC = BN + NC = PK + PK = AK$$

$$\frac{BM}{BC} = \frac{AK}{AK} = \frac{1}{1}$$

$$\frac{S_{BMN}}{S_{ABC}} = \frac{BM \times BN}{BA \times BC} = \frac{1}{1} \Rightarrow \frac{1}{1} = \frac{BM}{BA} \times \frac{1}{1}$$

$$BA = BM + AM$$

$$\frac{BM}{BA} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$$

$$\frac{BM}{BM + AM} = \frac{1}{4} \rightarrow \frac{BM}{AM} = \frac{1}{4-1} = \frac{1}{3}$$

$$\frac{1}{\sqrt{\cos^2 \alpha}} - \tan \alpha = \frac{1 + \sin \alpha}{|\cos \alpha|} \Rightarrow \cos \alpha \neq 0 \Rightarrow \cot \alpha \neq 0$$

قال

$$\Rightarrow \sin \alpha < 0$$

$$\frac{|\sin \alpha|}{\cos \alpha} = -\frac{1}{\cot \alpha} = -\frac{\sin \alpha}{\cos \alpha} \rightarrow |\sin \alpha| = -\sin \alpha$$

قال

$$\frac{\sin \alpha < 0}{\sin \alpha \neq 0}$$

$$\rightarrow -\frac{\sin \alpha}{\cos \alpha} = -\frac{\sin \alpha}{\cos \alpha} \rightarrow \sin \alpha < 0, \cos \alpha \neq 0 \Rightarrow \tan \alpha < 0$$

$$\frac{1}{\sqrt{\cos^2 \alpha}} - \tan \alpha = \frac{1 + \sin \alpha}{|\cos \alpha|}$$

$$\frac{1 - 1 - \sin \alpha}{\cos \alpha} = \frac{\sin \alpha}{\cos \alpha}$$

$$\frac{-\sin \alpha}{|\cos \alpha|} = \frac{\sin \alpha}{\cos \alpha}$$

$$\frac{-1}{|\cos \alpha|} = \frac{1}{\cos \alpha} \Rightarrow \frac{|\cos \alpha|}{\cos \alpha} = -1$$

$$\rightarrow \cos \alpha < 0 \Rightarrow \cos \alpha < 0$$

$$\Rightarrow \tan \alpha < 0$$