سوال ۱)

الف) $\tan\frac{11\pi}{4} + \sin\frac{15\pi}{4} \cdot \cos\frac{13\pi}{4} =$

$\tan\left(\frac{8\pi}{4} + \frac{3\pi}{4}\right) = -1$ (135°)

$\sin\left(\frac{12\pi}{4} + \frac{3\pi}{4}\right) = -\frac{\sqrt{2}}{2}$ (315°)

$\cos\left(\frac{12\pi}{4} + \frac{\pi}{4}\right)$ (225°) $= -\frac{\sqrt{2}}{2}$

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

ب) $\tan\frac{17\pi}{6} \cdot \sin\frac{11\pi}{3} + \cos\frac{10\pi}{3} =$

$\tan\left(\frac{12\pi}{6} + \frac{5\pi}{6}\right) = -\frac{\sqrt{3}}{3}$

$\sin\left(\frac{9\pi}{3} + \frac{2\pi}{3}\right) = -\frac{\sqrt{3}}{2}$ (300°)

$\cos\left(\frac{9\pi}{3} + \frac{\pi}{3}\right)$ (240°) $= -\frac{1}{2}$

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

$\frac{+3}{6} = \frac{1}{2} - \frac{1}{2} = 0$

سوال ۲)

$\frac{3\cos x - \sin x}{\cos x + 4\sin x} = \frac{12\sin x - \sin x}{\cos x + 4\sin x} = \frac{11\sin x}{5\sin x} = \frac{11}{5} = 2.2$

$\cot = 4$

$\frac{\cos x}{\sin x} = 4 \Rightarrow \cos x = 4\sin x$

سوال ۳)

$\cos\alpha =$

$\sin\alpha = 2\cos\alpha$ ← انتهای آن در ربع سوم مثلثاتی

$\tan = 2 \Leftarrow \frac{\sin}{\cos} = 2$

$1 + \tan^2 = \frac{1}{\cos^2}$

$1 + 4 = \frac{1}{\cos^2} \Rightarrow 5 = \frac{1}{\cos^2}$

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

ربع سوم ← $-\frac{\sqrt{5}}{5}$

سوال ۴)

الف) $\cos\left(\frac{11\pi}{4} + \alpha\right) = \cos\left(\frac{8\pi}{4} + \frac{3\pi}{4} + \alpha\right) \Rightarrow \cos\left(\frac{3\pi}{4} + \alpha\right) =$

$\cos\frac{3\pi}{4} \cdot \cos\alpha - \sin\frac{3\pi}{4} \cdot \sin\alpha =$

$\left(-\frac{\sqrt{2}}{2} \cdot \frac{7\sqrt{2}}{10}\right) - \left(\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{10}\right)$

$\frac{14}{20} - \frac{2}{20} = \frac{12}{20} = \frac{6}{10}$

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

$\left(\frac{\sqrt{2}}{10}\right)^2 + \cos^2 = 1$

$\frac{2}{100} + \cos^2 = 1$

$\cos^2 = \frac{98}{100}$

$\cos = \pm\frac{7\sqrt{2}}{10}$ ربع سوم

ب) $\sin\left(\frac{13\pi}{4} + \alpha\right) =$

$\tan\alpha = \frac{1}{7}$

$\sin\left(\frac{12\pi}{4} + \frac{\pi}{4} + \alpha\right)$ $(225° + \alpha)$

$\sin(225° + \alpha) \Rightarrow \sin 225° \cdot \cos\alpha + \sin\alpha \cdot \cos 225°$

$\left(-\frac{\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{10}\right) + \left(\frac{7\sqrt{2}}{10} \cdot -\frac{\sqrt{2}}{2}\right) \Rightarrow$

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

$1 + \frac{1}{49} = \frac{1}{\sin^2}$

$\frac{50}{49} = \frac{1}{\sin^2} \Rightarrow \sin^2 = \frac{49}{50}$

ربع اول $\sin\alpha = \pm\frac{7}{5\sqrt{2}}$

$\sin\alpha = \frac{7\sqrt{2}}{10}$

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

$\frac{98}{100} + \cos^2 = 1$

$\cos^2 = \frac{2}{100} \Rightarrow \cos = \pm\frac{\sqrt{2}}{10}$ ناحیه اول

$\frac{-2}{20} - \frac{14}{20} = \frac{-8}{10}$

Scanned with CamScanner

سوال ۵)
هلیا عرب

$2\sin^2 x + \cos^2 x = \frac{4}{3} \Rightarrow 6\sin^2 x + 3\cos^2 x = 4$

$6(1-\cos^2 x) + 3\cos^2 x = 4$

$6 - 6\cos^2 x + 3\cos^2 x = 4$

$-3\cos^2 x = -2$

$\cos^2 x = \frac{2}{3}$

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

$1 + \tan^2 = \frac{3}{2}$

$\tan^2 = \frac{3}{2} - 1 \Rightarrow \tan^2 = \frac{1}{2}$

سوال ۶)

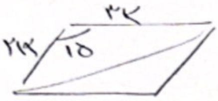
$S = \frac{1}{2} \cdot \sin\alpha \cdot 6 \cdot \sqrt{3} \Rightarrow 4.5 = \sin\alpha \cdot 3\sqrt{3}$

$\sin\alpha = \frac{4.5}{3\sqrt{3}} \Rightarrow \frac{\sqrt{3}}{2}$

$60°$ ، $120°$ حاده

$\frac{120}{60} = 2$

سوال ۷)



$S = 54$

$27 = \frac{1}{2} \cdot \frac{1}{2} \cdot 2k \cdot 3k \Rightarrow$

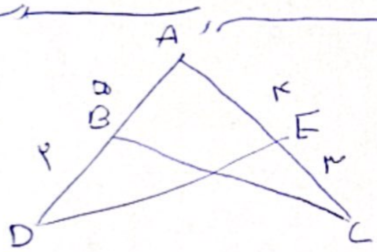
$27 = \frac{3k^2}{2} \Rightarrow k^2 = 18 \Rightarrow k = \pm 3\sqrt{2}$

$2 \times 3\sqrt{2} = 6\sqrt{2}$

$3 \times 3\sqrt{2} = 9\sqrt{2}$

$2(6\sqrt{2} + 9\sqrt{2}) = 30\sqrt{2}$ ($15\sqrt{2}$)

سوال ۸)



$\frac{1}{2} \cdot 7 \cdot 4 \times \sin A - \frac{1}{2} \cdot 5 \cdot 7 \cdot \sin A = 1.75$

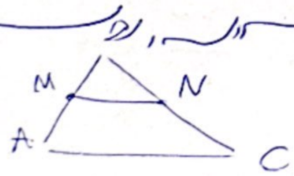
$14\sin A - \frac{35}{2}\sin A = 1.75$

$-\frac{7}{2}\sin A = 1.75$

$\sin A = +\frac{1}{2} \Rightarrow \sin A = \frac{1}{2}$

$A = 30° \Rightarrow \tan 30° = \frac{\sqrt{3}}{3}$

سوال ۹)



$4BN = 3NC$

$BN = 3$

$NC = 4$

$S = \frac{1}{2} \cdot AB \cdot BC \cdot \sin B$ ($BC = 7$)

$S_{BMN} = \frac{1}{2} \cdot 3 \cdot BM \cdot \sin B$

$S_{ABC} = 3 S_{BMN}$

$AB = BM + AM \Rightarrow$

$AM = \frac{4}{5} BM$

$AM = \frac{4}{5} BM \Rightarrow \frac{BM}{AM} = \frac{BM}{\frac{4}{5}BM} = \frac{5}{4}$

$AB \times 5 = 3BM \times 3$

$AB = \frac{9}{5} BM$

سوال ۱۰)

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

$-\cos\alpha = |\cos\alpha| \Rightarrow \cos\alpha < 0$

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

$|\sin\alpha| = -\sin\alpha$ → ۳ و ۴ → اشتراک → ناحیه ۳