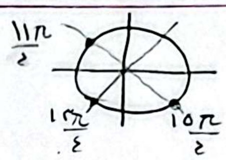
لعیا گرباسیان — جبر ۲ م صدای — تکلیف سری ۱۸

۱-

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

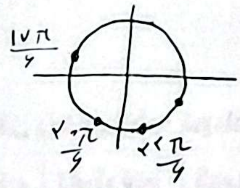
$\tan \frac{11\pi}{4} = -1, \quad \sin \frac{15\pi}{4} = -\frac{\sqrt{2}}{2}, \quad \cos \frac{13\pi}{4} = -\frac{\sqrt{2}}{2}$

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



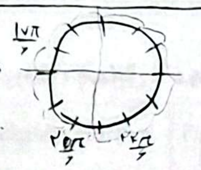
$= -1 + \frac{2}{4} = \frac{-2}{4} = -\frac{1}{2}$

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



$\frac{11\pi}{3} = \frac{22\pi}{6}$

$\frac{10\pi}{3} = \frac{20\pi}{6}$



$\tan \frac{17\pi}{6} \times \sin \frac{11\pi}{3} + \cos \frac{10\pi}{3} = \tan \frac{5\pi}{6} \times \sin \frac{5\pi}{3} + \cos \frac{4\pi}{3}$

$= -\frac{1}{\sqrt{3}} \times (-\sqrt{3}) + \left(-\frac{1}{2}\right) = 1 - \frac{1}{2} = \frac{1}{2}$

۲-

$\cot x = 4$

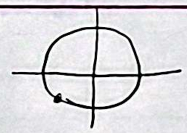
$\frac{\cos x}{\sin x} = 4$

$\cos x = 4 \sin x$

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

۳-

$\sin \alpha = 2 \cos \alpha$



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

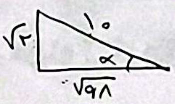
$(2\cos\alpha)^2 + \cos^2\alpha = 1$

$4\cos^2\alpha + \cos^2\alpha = 1 \rightarrow 5\cos^2\alpha = 1$

$\cos\alpha = \frac{\sqrt{5}}{5}$ ربع سوم $\rightarrow -\frac{\sqrt{5}}{5}$

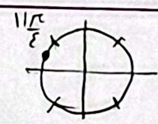
۴- الف)

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



$\cos\alpha = \frac{\sqrt{98}}{10}$

$\cos\left(\alpha + \frac{11\pi}{4}\right)$



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

$= \cos\alpha \times \cos \frac{3\pi}{4} + \sin\alpha \times \sin \frac{3\pi}{4}$

$= \frac{\sqrt{98}}{10} \times \frac{-\sqrt{2}}{2} + \frac{\sqrt{2}}{10} \times \frac{\sqrt{2}}{2}$

$= \frac{-14}{20} + \frac{2}{20} = \frac{-12}{20} = \frac{-3}{5}$

«قسمت ب در آخر فایل قرار دارد»

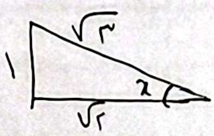
۵-

$2\sin^2 x + \cos^2 x = \frac{4}{3} \qquad \tan^2 x = ?$

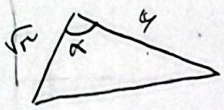
$-\quad \sin^2 x + \cos^2 x = 1$

$\sin^2 x = \frac{1}{3}$

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



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

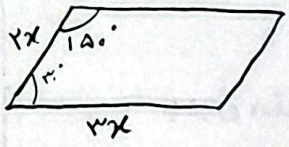


$\frac{1}{2}\sin\alpha \times \sqrt{2} \times 4 = 1,4$

$\frac{\sin\alpha}{2} = \frac{a}{4\sqrt{2}}$

$\sin\alpha = \frac{2}{2\sqrt{2}} = \frac{2\sqrt{2}}{4} = \frac{\sqrt{2}}{2}$

$\frac{\max\alpha}{\min\alpha} = \frac{120^\circ}{60^\circ} = 2$ -۶

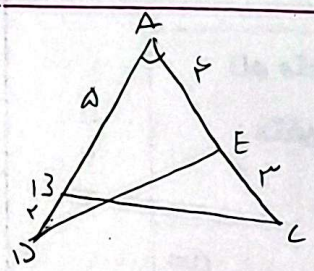


$S = \sin\alpha \times 2x \times 2x$ $\quad P = 4x + 6x = 10x = 20\sqrt{2}$ -۷

$S = \frac{1}{2} \times 6x^2$

$36 = 2x^2$

$18 = x^2 \rightarrow x = 3\sqrt{2}$



$|S_{ABC} - S_{ADE}| = 1,75$ -۸

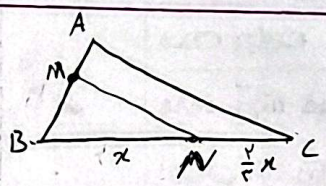
$\left|\sin\hat{A} \times \frac{1}{2} \times 5 \times 7 - \frac{1}{2}\sin\hat{A} \times 4 \times 7\right| = 1,75$

$\frac{35}{2}\sin\hat{A} - \frac{28}{2}\sin\hat{A} = 1,75$

$\sin\hat{A}\left(\frac{7}{2}\right) = 1,75$

$\sin\hat{A} = \frac{1}{2}$ $\quad \cos\hat{A} = \frac{\sqrt{3}}{2}$

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



$2BMN = 2NC$

$\frac{2}{2}BN = NC$

$\frac{S_{ABC}}{S_{BMN}} = 3 = \frac{\frac{1}{2}\sin\hat{B} \times AB \times 2(x + \frac{2x}{2})}{\frac{1}{2}\sin\hat{B} \times BM \times x}$ -۹

$3 = \frac{AB \times \frac{3x}{2}}{BM \times x}$

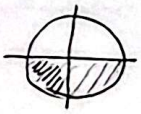
$9\,BM = 5AM + 5BM$

$4BM = 5AM$

$\frac{9}{5} = \frac{(AM + BM)}{BM}$

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

$\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \rightarrow \frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \rightarrow |\sin\alpha| = -\sin\alpha \rightarrow \sin\alpha < 0$ -۱۰



$-1 < \sin\alpha < 0$

$-2 < 2\sin\alpha < 0$

$-1 < 1 + 2\sin\alpha < 0$

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

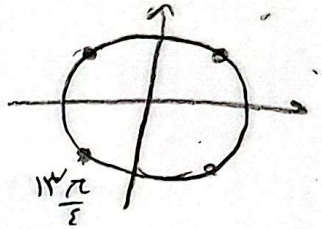
$\frac{1}{|\cos\alpha|} = \frac{1 + 2\sin\alpha}{\cos\alpha} \rightarrow |\cos\alpha| = \frac{\cos\alpha}{1 + 2\sin\alpha}$ $\quad \cos\alpha < 0$

$\frac{\cos\alpha}{1 + 2\sin\alpha} > 0$

موفق

۴ - ب)

$\tan\alpha = \frac{1}{۷}$ $\quad \sin\left(\frac{۱۴\pi}{۳} + \alpha\right)$



$= \frac{۵\pi}{۳}$

$= \sin\frac{۱۴\pi}{۳} \times \cos\alpha + \sin\alpha \times \cos\frac{۱۴\pi}{۳}$

$= \frac{-\sqrt{۳}}{۲} \times \frac{۷}{\sqrt{۵۰}} + \frac{-۱}{\sqrt{۵۰}} \times \frac{-\sqrt{۳}}{۲}$

$= \frac{-۷\sqrt{۳}}{۲\sqrt{۵۰}} + \frac{\sqrt{۳}}{۲\sqrt{۵۰}} = \frac{-۶\sqrt{۳}}{۲\sqrt{۵۰}} = -۳ \times \sqrt{\frac{۳}{۵۰}} = -۳ \times \frac{۱}{۵} = \boxed{-\frac{۳}{۵}}$