نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

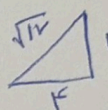
الف) $\tan\frac{11\pi}{4} + \sin\frac{15\pi}{4}\cos\frac{13\pi}{4} = -1 + \left(\frac{\sqrt{2}}{2}\right)\left(-\frac{\sqrt{2}}{2}\right) = -1 + \frac{1}{2} = -\frac{1}{2}$

ب) $\tan\frac{17\pi}{6}\sin\frac{11\pi}{3} + \cos\frac{10\pi}{3} = \left(-\frac{\sqrt{3}}{3}\right)\left(-\frac{\sqrt{3}}{2}\right) + \left(-\frac{1}{2}\right) = \frac{1}{2} - \frac{1}{2} = 0$

۲

$\frac{3\cos x - \sin x}{\cos x + \sin x} = \frac{3\times 4 - 1}{4+1} = \frac{11}{5} = 2,2$

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



۳

$\sin\alpha = 2\cos\alpha \qquad \sin\alpha < 0 \quad \cos\alpha < 0$

$\sin^2\alpha + \cos^2\alpha = 1 \qquad (2\cos\alpha)^2 + \cos^2\alpha = 1 \qquad 5\cos^2\alpha = 1 \quad \cos^2\alpha = \frac{1}{5}$

$\cos\alpha = \pm\frac{1}{\sqrt{5}}$ ← غ ق ت

$\cos\alpha = -\frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = -\frac{\sqrt{5}}{5}$

۴

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

$\left(-\frac{\sqrt{2}}{2}\right)\times\left(-\frac{\sqrt{98}}{10}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{10}\right) = \frac{14}{20} - \frac{2}{20} = \frac{12}{20} = \frac{6}{10} = \frac{3}{5}$

$\cos^2\alpha = 1 - \sin^2\alpha = 1 - \frac{2}{100} = \frac{98}{100}$

$\cos\alpha = \pm\frac{\sqrt{98}}{10}$ ← غ ق ت

ب) $1 + \tan^2\alpha = \frac{1}{\cos^2\alpha} \qquad 1 + \frac{1}{24} = \frac{1}{\cos^2\alpha}$

$\cos^2\alpha = \frac{5}{\sqrt{30}} \qquad \sin^2\alpha = 1 - \frac{24}{30} = \frac{1}{30}$

$\sin\alpha = \frac{1}{\sqrt{30}}$

ب)

$\sin\left(\frac{13\pi}{4} + \alpha\right) = \sin\left(\frac{5\pi}{4} + \alpha\right) = \sin\frac{5\pi}{4}\cos\alpha + \cos\frac{5\pi}{4}\sin\alpha =$

$\left(-\frac{\sqrt{2}}{2}\right)\left(\frac{5}{\sqrt{30}}\right) + \left(-\frac{\sqrt{2}}{2}\right)\left(\frac{1}{\sqrt{30}}\right) = -\frac{5}{10} - \frac{1}{10} = -\frac{6}{10}$

۵

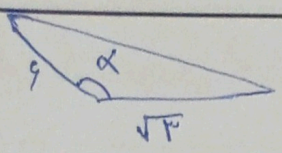
$2\sin^2 x + \cos^2 x = \frac{4}{3}$

$\sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_{1} = \frac{4}{3}$

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

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

۶



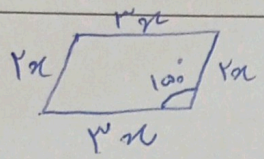
$\frac{1}{2} \times 9 \times \sqrt{3} \times \sin\alpha = 6/\omega$ $\quad \sin\alpha = \frac{6/\omega}{9\sqrt{3}} = \frac{6/\omega \times 1/\omega}{9 \times \sqrt{3}}$

$= \frac{1\omega}{15\sqrt{3}} = \frac{\sqrt{3}}{2}$

$\sin 60^\circ = \frac{\sqrt{3}}{2}$
$\sin 120^\circ = \frac{\sqrt{3}}{2}$
$\Big\}\ \alpha = 60 \text{ یا } \alpha = 120$

$\frac{\text{Max}\,\alpha}{\text{Min}\,\alpha} = \frac{120}{60} = 2$

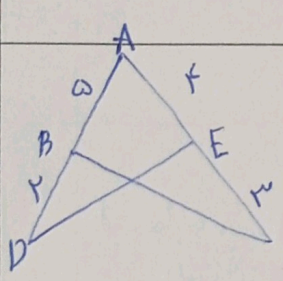
۷



$۳x \times ۲x \times \sin ۱۵۰ = ۵۴$ $\quad ۳x \times ۲x \times \frac{1}{2} = ۵۴$ $\quad x = \sqrt{۱۸} = ۳\sqrt{۲}$

$۳x + ۲x + ۳x + ۲x = ۱۰x = ۱۰ \times ۳\sqrt{۲} = ۳۰\sqrt{۲}$

۸



$S_{ABC} - S_{ADE} = ۱/۷۵$

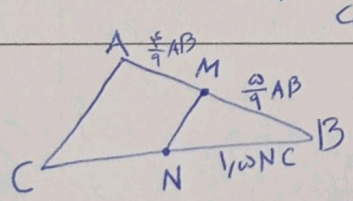
$\frac{1}{2} \times ۵ \times ۷ \times \sin A - \frac{1}{2} \times ۴ \times ۷ \times \sin A = ۱/۷۵$

$\frac{۳۵}{2} \sin A - \frac{۲۸}{2} \sin A = ۱/۷۵$

$\frac{۷}{2} \sin A = ۱/۷۵ \Rightarrow \sin A = \frac{1}{2}$ $\quad \cos A = \frac{\sqrt{3}}{2}$

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

۹



$۲BN = ۳NC$ $\quad BN = \frac{3}{2} NC$

$۵AB = ۹BM$ $\quad BM = \frac{۵}{۹} AB$

$\frac{S_{ABC}}{S_{BMN}} = ۳ \quad \frac{\frac{1}{2} \times AB \times BC \times \sin B}{\frac{1}{2} \times BM \times BN \times \sin B} = ۳ \quad \frac{AB \times ۲/۵NC}{BM \times ۱/۵NC} = ۳ \quad \frac{AB}{BM} = \frac{۹}{۵}$

$\frac{BM}{AM} = \frac{\frac{۵}{۹}}{\frac{۴}{۹}} = \frac{۵}{۴}$

۱۰

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

$\sin\alpha < 0$

با ضرب

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

$\cos\alpha < 0$

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