Date: Sub:

مریم سعدی زاده تکلیف شماره ۱۸ دهم A

س ۱:

الف)

$\dfrac{\frac{11\pi}{4}}{\pi} = \dfrac{x}{180} \to x = 495^\circ \Rightarrow \tan 495^\circ = \tan 135^\circ = -1$

$\dfrac{\frac{15\pi}{4}}{\pi} = \dfrac{x}{180} \to x = 675^\circ \Rightarrow \sin 675^\circ = \sin 315^\circ = -\dfrac{\sqrt{2}}{2}$

$\dfrac{\frac{13\pi}{4}}{\pi} = \dfrac{x}{180} \to x = 585^\circ \Rightarrow \cos 585^\circ = \cos 225^\circ = -\dfrac{\sqrt{2}}{2}$

$-1 + \left(\dfrac{-\sqrt{2}}{2} \times \dfrac{-\sqrt{2}}{2}\right) = -1 + \dfrac{1}{2} = \boxed{-\dfrac{1}{2}}$

ب)

$\dfrac{\frac{17\pi}{6}}{\pi} = \dfrac{x}{180} \to x = 510^\circ \Rightarrow \tan 510^\circ = \tan 150^\circ = \dfrac{-\sqrt{3}}{3}$

$\dfrac{\frac{11\pi}{3}}{\pi} = \dfrac{x}{180} \to x = 660^\circ \Rightarrow \sin 660^\circ = \sin 300^\circ = \dfrac{-\sqrt{3}}{2}$

$\dfrac{\frac{10\pi}{3}}{\pi} = \dfrac{x}{180} \to x = 600^\circ \Rightarrow \cos 600^\circ = \cos 240^\circ = \dfrac{-1}{2}$

$\left(\dfrac{-\sqrt{3}}{3} \times \dfrac{-\sqrt{3}}{2}\right) + \dfrac{-1}{2} = \boxed{0}$ (above: $\dfrac{1}{2}$)

س ۲:

$\cot x = 4 \to \cos x = 4\sin x$

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

س ۳:

$\sin\alpha = 2\cos\alpha,\ \sin\alpha < 0,\ \cos\alpha < 0 \Rightarrow \cos\alpha = ?\ \dfrac{-1}{\sqrt{5}} = \boxed{\dfrac{-\sqrt{5}}{5}}$

$\sin^2\alpha + \cos^2\alpha = 1 \quad 4\cos^2\alpha + \cos^2\alpha = 1$

$5\cos^2\alpha = 1$

$\cos^2\alpha = \dfrac{1}{5} \to \cos\alpha = \dfrac{1}{\sqrt{5}}$ (crossed out), $-\dfrac{1}{\sqrt{5}}$

س ۴: الف)

$\cos\alpha < 0,\ \sin\alpha = \dfrac{\sqrt{2}}{10} \quad \cos^2\alpha = 1 - \sin^2\alpha \Rightarrow \cos^2\alpha = \dfrac{98}{100} \Rightarrow \cos\alpha = \dfrac{-7\sqrt{2}}{10}$

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

$\left(\dfrac{-\sqrt{2}}{2} \times \dfrac{-7\sqrt{2}}{10}\right) - \left(\dfrac{\sqrt{2}}{2} \times \dfrac{\sqrt{2}}{10}\right) = \dfrac{7}{10} - \dfrac{1}{10} = \boxed{0/6}$

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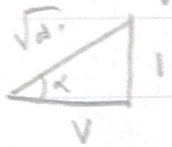
۴۳ ب)

$\cos\alpha > 0$

$\sin\alpha > 0$

$\tan\alpha = \frac{1}{7} \Rightarrow$ $\sin\alpha = \frac{1}{5\sqrt{2}} = \frac{\sqrt{2}}{10}$, $\cos\alpha = \frac{7}{5\sqrt{2}} = \frac{7\sqrt{2}}{10}$ $\Rightarrow$



$\frac{13\pi}{4} = 585^\circ \Rightarrow \sin 585^\circ = \sin 225^\circ = -\frac{\sqrt{2}}{2}$

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

$\left(\frac{-\sqrt{2}}{2}\times\frac{\sqrt{2}}{10}\right) - \left(\frac{-\sqrt{2}}{2}\times\frac{7\sqrt{2}}{2}\right) = \boxed{-\frac{8}{10}}$

۵س:

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

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

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

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

۶س:

$S = \frac{1}{2}ab\sin\alpha = \frac{1}{2}\times\sqrt{3}\times\sqrt{9}\times\sin\alpha = 4.5 \Rightarrow \sin\alpha = \frac{4.5}{3\sqrt{3}} = \frac{\sqrt{3}}{2}$

$\alpha = 60$

$\alpha = 120$

$\frac{\max\alpha}{\min\alpha} = \frac{120}{60} = \boxed{2}$

۷س:

$S = 54 = ab\sin\alpha = 3x\times 2x\times \underbrace{\sin 150}_{\frac{1}{2}} = 3k^2 = 54$

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

۸س:

$\overset{\triangle}{ABC} - \overset{\triangle}{ADE} = \left(\frac{1}{2}\sin\hat{A}\times 5\times 7\right) - \left(\frac{1}{2}\sin\hat{A}\times 4\times 7\right)$

$17.5\sin A - 14\sin A = 3.5\sin A = 1.75 \Rightarrow \sin A = \frac{1}{2}$

$\cos^2 A = 1 - \sin^2 A = 1 - \frac{1}{4} = \frac{3}{4} \Rightarrow \cos A = \pm\frac{\sqrt{3}}{2} \Rightarrow \tan A = \frac{\sin A}{\cos A} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \boxed{\frac{\sqrt{3}}{3}}$

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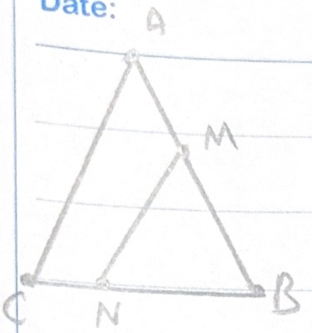

س ۹:

$BN = 1{,}5\,NC$, $BC = 2{,}5\,NC$

$$\frac{S_{ABC}}{S_{MNB}} = \frac{\frac{1}{2}\sin B \times 2{,}5NC \times AB}{\frac{1}{2}\sin B \times 1{,}5NC \times MB} = \frac{2{,}5\,AB}{1{,}5\,MB} = 3 \Rightarrow AB = \frac{9}{5}MB = AM + MB$$

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

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

س ۱۰:

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

$$\frac{-1}{|\cos\alpha|} = \frac{1}{\cos\alpha} \Rightarrow \cos\alpha < 0 \rightarrow \text{ناحیه ۲ و ۳} \quad (1)$$

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

$$(2)\quad \sin\alpha < 0 \rightarrow \text{ناحیه ۳ و ۴}$$

$(1)\cap(2) \rightarrow$ ناحیه ۳ : اشتراک می‌گیریم

$\sin\alpha < 0$, $\cos\alpha < 0$

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