نام و نام خانوادگی امیرعباس عادلی پاسخنامه تشریحی تکلیف شماره ۱۸ کلاس دهم B

$\tan\left(\frac{13\pi}{4}-\frac{\pi}{4}\right)+\sin\left(\frac{12\pi}{4}+\frac{3\pi}{4}\right)\cos\left(\frac{12\pi}{4}+\frac{\pi}{4}\right)=$

$\downarrow 3\pi \quad \downarrow 3\pi \quad \downarrow 3\pi$

$-\tan\left(\frac{\pi}{4}\right)+\sin\left(\frac{3\pi}{4}\right)\times\cos\left(\frac{\pi}{4}\right)=-1+\left(\frac{\sqrt{2}}{2}\times\frac{\sqrt{2}}{2}\right)=\frac{1}{2}-1=-\frac{1}{2}$ ۱

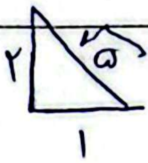
$\tan\left(\frac{19\pi}{6}-\frac{\pi}{6}\right).\sin\left(\frac{13\pi}{3}-\frac{\pi}{3}\right)+\cos\left(\frac{19\pi}{6}+\frac{5\pi}{6}\right)=$

$\downarrow 3\pi \quad \downarrow 4\pi \quad \downarrow 4\pi$

$-\cot\left(\frac{\pi}{6}\right)\times\sin\left(\frac{\pi}{3}\right)+-\cos\left(\frac{2\pi}{3}\right)=-\frac{\sqrt{3}}{3}\times-\frac{\sqrt{3}}{2}+\left(-\frac{1}{2}\right)=0$

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

$\frac{3\cos x-\sin x}{\cos x+\sin x}=\frac{3(4\sin x)-\sin x}{(4\sin x)+\sin x}=\frac{11\sin x}{5\sin x}=\boxed{\frac{11}{5}}$ ۲

$\sin\alpha=2\cos\alpha \Rightarrow \frac{\sin\alpha}{\cos\alpha}=\tan\alpha=\frac{2}{1} \longrightarrow$  $\sqrt{1^2+2^2}=\sqrt{5}=$ وتر

$\Rightarrow \sin\alpha=\frac{-2}{\sqrt{5}}$ و $\cos\alpha=-\frac{1}{\sqrt{5}}=\frac{-\sqrt{5}}{5}$ ۳

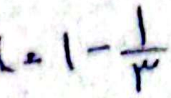
(سوال ۴ قسمت الف) $\cos\left(\frac{11\pi}{4}\right)\cos\alpha-\sin\left(\frac{11\pi}{4}\right)\sin\alpha=\frac{-\sqrt{2}\times-7\sqrt{2}}{10\times2}-\frac{1}{10}=\frac{7}{10}-\frac{1}{10}=\boxed{\frac{3}{5}}$

$\downarrow \frac{-\sqrt{2}}{2} \qquad \downarrow \sqrt{1-\frac{2}{10^2}}=\frac{7\sqrt{2}}{10} \qquad \downarrow -1\times\frac{\sqrt{2}}{2} \qquad \times \quad \downarrow \frac{\sqrt{2}}{10}$

$\frac{-7\sqrt{2}}{10} \Leftarrow$ چون ناحیه ۲ است

(قسمت ب) $\sin\left(\frac{13\pi}{4}\right)\cos\alpha+\cos\left(\frac{13\pi}{4}\right)\sin\alpha=\frac{-7}{10}-\frac{1}{10}=\frac{-8}{10}=\boxed{-\frac{4}{5}}$ ۴

$\downarrow \frac{-\sqrt{2}}{2}\times\frac{7}{5\sqrt{2}} \qquad \downarrow \frac{-\sqrt{2}}{2}\times\frac{1}{5\sqrt{2}}$

$\tan=\frac{1}{7} \Rightarrow$  $\Rightarrow \sqrt{1^2+7^2}=\sqrt{50}=5\sqrt{2} \rightarrow$ وتر $\Rightarrow \sin=\frac{1}{5\sqrt{2}}$ و $\cos=\frac{7}{5\sqrt{2}}$

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

حال میگوییم: $\cos^2x=1-\frac{1}{3}=\frac{2}{3} \Rightarrow$ ۵

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

$S = \frac{1}{۲}ab\sin a \longrightarrow \frac{۳۶}{۲} = \frac{1}{۲}\times\sqrt{۳}\times\frac{۶}{۲}\times\sin\alpha \Rightarrow \sin\alpha = \frac{۳\times۴}{۲\sqrt{۳}\times۶} = \frac{۲\sqrt{۳}}{۶} = \boxed{\frac{\sqrt{۳}}{۲}}$

$\Rightarrow \alpha = \frac{\pi}{۳}$ یا $\alpha = \frac{۲\pi}{۳}$ $\Rightarrow \frac{\alpha_{max}}{\alpha_{min}} = \frac{\frac{۲\pi}{۳}}{\frac{\pi}{۳}} = \boxed{۲}$ ۶

(۶۰°) کمترین حالت — (۱۲۰°) بیشترین حالت

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$ab\sin\theta = S \Rightarrow \sin(۱۵۰°)\times(۳k)(۲k) = ۵۴ \Rightarrow \sin(۱۵۰°)\times ۶k^۲ = ۵۴$

$\Rightarrow k^۲ = \frac{۵۴}{۳} = ۱۸ \Rightarrow k = \sqrt{۱۸} \Rightarrow ۲k = ۶\sqrt{۲}$ و $۳k = ۹\sqrt{۲}$

$\Rightarrow$ محیط متوازی‌الاضلاع $= (۶\sqrt{۲}+۹\sqrt{۲})۲ = \boxed{۳۰\sqrt{۲}}$ ۷

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$S_{ABC} = ۷\times۵\times\sin A\times\frac{1}{۲} = \frac{۳۵\sin A}{۲}$

$S_{ADE} = ۷\times\cancel{۴}^{۲}\times\sin A\times\frac{1}{\cancel{۲}} = ۱۴\sin A$

$\underbrace{\left(\frac{۳۵}{۲}-\frac{۲۸}{۲}\right)}_{\frac{۷}{۲}}\sin A = ۱/۷۵ \Rightarrow \boxed{\sin A = \frac{1}{۲}}$ ۸

$\tan\hat{A} = \frac{1}{\sqrt{۳}} = \boxed{\frac{\sqrt{۳}}{۳}}$

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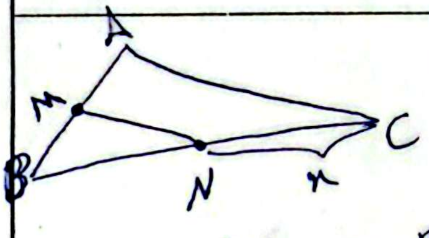


$\cancel{\frac{MN}{AC} = \frac{BM}{AB} = \frac{BN}{BC}}$

$S_{ABC} = ۳S_{BNM} \Rightarrow BM\times \overset{\frac{۳NC}{۲}}{BN}\times\frac{1}{۲}\times۳\times\cancel{\sin B} = \underset{(AM+BM)}{AB}\times\underset{(BN+NC)}{BC}\times\frac{1}{۲}\times\cancel{\sin B} \Rightarrow$ ۹

$\frac{۹BM\,NC}{۲} = \frac{۳AM\,NC}{۲} + \frac{۲AM\,NC}{۲} + \frac{۳BM\,NC}{۲} + \frac{۲BM\,NC}{۲} \Rightarrow \frac{۹MB\,NC - ۵BM\,NC}{\cancel{۲}} =$

$\frac{۵AM\,NC}{\cancel{۲}} \Rightarrow \frac{BM\,NC}{AM\,NC} = \frac{۵}{۴} \Rightarrow \boxed{\frac{BM}{AM} = \frac{۵}{۴}}$

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$\frac{|\sin\alpha|}{\cos\alpha} = \frac{-\sin\alpha}{\cos\alpha} \Rightarrow |\sin\alpha| = -\sin\alpha \Rightarrow \boxed{\sin\alpha < 0}$ ۱۰

$\cancel{\frac{1}{|\cos\alpha|}} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|} = \cancel{\frac{1}{|\cos\alpha|}} + \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow$ $\Rightarrow$ $\boxed{\text{ناحیه سوم}}$

$\frac{-\sin\alpha}{\cos\alpha} = \frac{\sin\alpha}{|\cos\alpha|} \Rightarrow \frac{-1}{\cos\alpha} = \frac{1}{|\cos\alpha|} \Rightarrow \boxed{\cos\alpha < 0}$

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