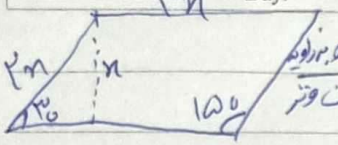
راه‌حل تکلیف ۴۶: مجموعه‌ی A و بازه‌ی [۰, ۲π]

۱- 

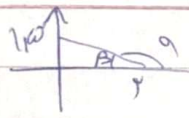
ضلع روبه‌رو به زاویه‌ی ۳۰° نصف وتر $\rightarrow h=x \rightarrow S=\frac{1}{2}x^2=8 \rightarrow x=\sqrt{16}=4\sqrt{2}$
$\rightarrow P=6x=24\sqrt{2}$

۲- $\frac{1}{2}\times 4\times 8\times \sin A-\frac{1}{2}\times 4\times 4\times \sin A=14\sqrt{8} \rightarrow \frac{1}{2}\times 4\times \sin A\times(8-4)=14\sqrt{8}$

$\rightarrow \sin A=\frac{1}{2} \rightarrow A=30^\circ \quad \tan 30^\circ=\frac{\sqrt{3}}{3}$

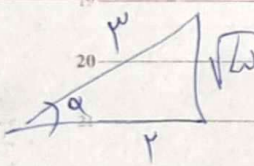
۳- $\frac{1}{|\cos\alpha|}-\frac{\sin\alpha}{\cos\alpha}=\frac{1}{|\cos\alpha|}+\frac{\sin\alpha}{|\cos\alpha|} \rightarrow -\frac{\sin\alpha}{\cos\alpha}=\frac{\sin\alpha}{\cos\alpha} \rightarrow \cos\alpha<0$ I

$\frac{|\sin\alpha|}{\cos\alpha}=-\frac{\sin\alpha}{\cos\alpha} \rightarrow \sin\alpha<0$ II $\xrightarrow{\text{I, II}}$ انتهای کمان α در ناحیه‌ی سوم مثلثاتی است

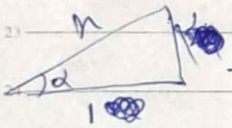
۴- $\tan\left(\frac{\pi}{2}-\alpha\right)=\cot\alpha$ 

$\rightarrow \cot\alpha=-\cot\beta=-\frac{9}{12}=-\frac{3}{4}$

۵- $\frac{3\cos(\frac{3\pi}{2}-2\alpha)-3\sin(\pi-2\alpha)}{\sin(\pi+2\alpha)-\cos(\frac{3\pi}{2}+2\alpha)}=\frac{-3\sin 2\alpha-3\sin 2\alpha}{-\sin 2\alpha-\sin 2\alpha}=\frac{-6\sin 2\alpha}{-2\sin 2\alpha}=3$ ω

۶- 

$\sin\alpha<0$
$\cos\alpha>0$
$\frac{\cos\alpha+\sin\alpha}{|\tan^2\alpha-1|}=\frac{\frac{2-\sqrt{8}}{3}}{\frac{8-1}{4}}=\frac{8-4\sqrt{8}}{3}$

۷- 

$\rightarrow x=\sqrt{8} \rightarrow \cos\alpha=\frac{-1}{\sqrt{8}}=\frac{-\sqrt{8}}{8}$

۸- $\frac{-2m}{m^2-1}=\tan 60^\circ=\sqrt{3} \rightarrow -2m=\sqrt{3}m^2-\sqrt{3} \rightarrow \sqrt{3}m^2+2m-\sqrt{3}=0 \rightarrow |m_1-m_2|=\frac{\sqrt{4}}{|a|}=\frac{\sqrt{12}}{3}$

۹- $\tan\left(-(x-\frac{\pi}{4})\right) \Rightarrow \frac{\pi}{4}-\frac{\pi}{2}<x-\frac{\pi}{4}<\frac{\pi}{3}-\frac{\pi}{4} \rightarrow 0<x<\frac{\pi}{3}$ $\tan x=\frac{1-m}{2+m}$
$\tan x>0 \rightarrow \frac{1-m}{2+m}>0 \rightarrow \frac{-2}{+}+\frac{1}{+}- \rightarrow -2<m<1$

۱۰- $\tan(2\pi-\theta)\cos(\pi+2\theta)+\tan(3\pi-\theta)\sin(5\pi-\theta)$
$=(-\tan\theta)(-\cos 2\theta)+(-\tan\theta)(\sin\theta)=-\sqrt{3}\left(\frac{-\sqrt{3}}{2}+\frac{\sqrt{3}}{2}\right)=0$