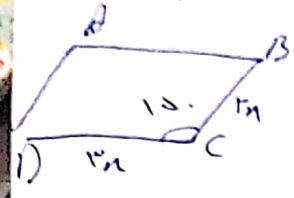
تمارین حل شده

سوال ۱:



$\frac{DC}{BC} = \frac{3}{2} \Rightarrow x = 6$ یا $x = -10$ (غ ق)

$BC = 2\sqrt{13}$

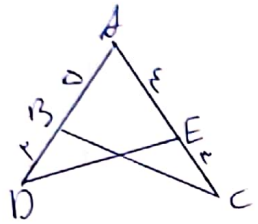
$DC = 3\sqrt{13}$

$S = 24 \Rightarrow S = 2x \cdot 3x \cdot \sin 60^\circ = \frac{1}{2}$ مساحت متوازی‌الاضلاع

$x^2 = 13 \Rightarrow x = \sqrt{13}$

$P = 2(2\sqrt{13} + 3\sqrt{13}) = 10\sqrt{13} = 36\sqrt{13}$ محیط متوازی‌الاضلاع

سوال ۲:



$S_{ABC} - S_{ADE} = 14.5$ $\tan \hat{A} = ?$

$S = \frac{1}{2} ab \sin\alpha \rightarrow S_{ABC} = \frac{1}{2} \times 5 \times 7 \times \sin A = \frac{35}{2} \sin A$

$S_{ADE} = \frac{1}{2} \times 7 \times 4 \times \sin A = 14 \sin A$

$\Rightarrow 10 \sin A = 14.5$

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

سوال ۳:

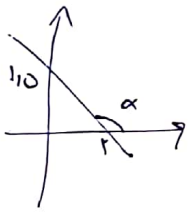
(۱) $\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|}$ (۲) $\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha}$

(۱) $\Rightarrow \frac{1}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{1+\sin\alpha}{|\cos\alpha|} \rightarrow -\frac{\sin\alpha}{\cos\alpha} = \frac{\sin\alpha}{|\cos\alpha|} \rightarrow \cos\alpha < 0$ I

I ∩ II $\Rightarrow$ ربع سوم

(۲) $\frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \rightarrow \sin\alpha \leq 0$ II

سوال ۴:

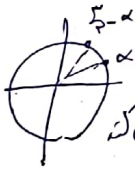


$\tan(\frac{\pi}{2} - a) = ?$

$(2, 0) \rightarrow y = \tan\frac{\pi}{2} \rightarrow 2a + \frac{\pi}{2} = 0 \rightarrow a = -\frac{\pi}{4}$

$(0, \frac{\pi}{2}) \rightarrow b = \frac{\pi}{2}$

$\Rightarrow y = (-\frac{\pi}{4})x + \frac{\pi}{2}$ $\rightarrow \tan x$



$\tan(\frac{\pi}{2} - \alpha) = \cos\alpha \rightarrow \cot\alpha = -\frac{4}{3}$

ناحیه قبل قبل

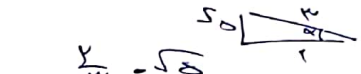
سوال ۵:

$$\frac{2\cos(240) - 2\sin(150)}{\sin(210) - \cos(240)} \Rightarrow \frac{3(\cos(270 - 30) - 3\sin(180 - 30))}{\sin(180 + 30) - \cos(270 + 30)} = \frac{-3\sin 30 - 2\sin 30}{-\sin 30 - \sin 30}$$

$$\frac{-5\sin 30}{-2\sin 30} = \frac{5}{2}$$

سوال ۶:

$$\frac{\sin\left(\frac{\pi}{2}+\alpha\right)-\sin(\alpha-\pi)}{|\tan^2\alpha-1|} \xrightarrow{+\sin(\pi-\alpha)} \frac{\cos\alpha+\sin\alpha}{|\tan^2\alpha-1|} = \frac{\frac{2}{3}-\frac{\sqrt{5}}{3}}{\left|\frac{5}{4}-1\right|} = \frac{\frac{2-\sqrt{5}}{3}}{\frac{1}{4}} = \frac{4(2-\sqrt{5})}{3}$$



سوال ۷:

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

$$\sin^2\alpha+\cos^2\alpha=1 \longrightarrow 5\cos^2\alpha=1 \longrightarrow \cos^2\alpha=\frac{1}{5} \longrightarrow |\cos\alpha|=\frac{1}{\sqrt{5}} \longrightarrow \cos\alpha=\frac{-1}{\sqrt{5}}=-\frac{\sqrt{5}}{5}$$

سوال ۸:

$$2mx+(m^2-1)y=2$$

$$y=-\frac{2m}{m^2-1}x+\frac{2}{m^2-1}$$

$$\frac{-2m}{m^2-1}=\tan 60^\circ \longrightarrow \frac{-2m}{m^2-1}=\sqrt{3} \longrightarrow \sqrt{3}m^2+2m-\sqrt{3}=0$$

$$m^2+2m-3=0 \longrightarrow m^2=1 \longrightarrow m=\frac{1}{\sqrt{3}}$$

$$m=-3 \longrightarrow m=-\frac{3}{\sqrt{3}}$$

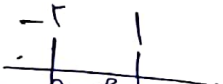
اختلاف شیب $\Rightarrow \left|\frac{1}{\sqrt{3}}-\left(-\frac{3}{\sqrt{3}}\right)\right|=\frac{4}{\sqrt{3}}=\frac{4\sqrt{3}}{3}$

سوال ۹:

$$\tan\left(\frac{\pi}{4}-x\right)=\frac{1-m}{2+m} \quad ; \quad -\frac{\pi}{4}<x<\frac{\pi}{4}$$

$$-\frac{\pi}{4}<x<\frac{\pi}{2} \longrightarrow 0<\frac{\pi}{2}-x$$

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



$$\rightarrow m\in(-2,1)$$

سوال ۱۰:

$$\tan(300^\circ)\cos(210^\circ)+\tan(480^\circ)\sin(840^\circ)$$

$$\tan(300^\circ)\cos(210^\circ)+\tan(180^\circ+120^\circ)\sin(720^\circ+120^\circ)$$

$$(-\sqrt{3})\times\left(-\frac{\sqrt{3}}{2}\right)+(-\sqrt{3})\times\left(\frac{\sqrt{3}}{2}\right)=0$$