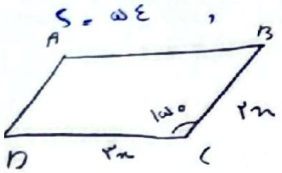
سوال ۱ =>



تشریحی ۴۶

$S = 6\sqrt{3}$, $\frac{BD}{BC} = \frac{3}{2}$, $\alpha = 150°$, $P_{?}$

مساحت ذوزنقه = ۲ × مساحت مثلث ABC

$S_{ABC} = \frac{1}{2} \times 2 \times 3 \times \sin 150° = 6\sqrt{3}$

$\sin 150° = \frac{1}{2}$

$6\sqrt{3} = 3x \sin 150°$

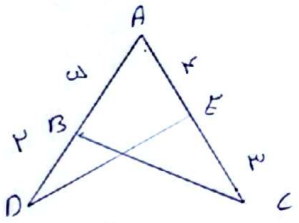
$x = 4\sqrt{3}$

$BC = 4\sqrt{3}$

$DC = 3\sqrt{3}$

محیط ذوزنقه $P = 2(4\sqrt{3} + 3\sqrt{3}) = 14\sqrt{3} = 30\sqrt{2}$

سوال ۲ =>



$S_{ABC} = \frac{1}{2} ab \sin\alpha$

$S_{ABC} = \frac{1}{2} \times 3 \times 7 \times \sin A = \frac{21}{2} \sin A$, $S_{ADE} = \frac{1}{2} \times 7 \times 4 \times \sin A = 14 \sin A$

$S_{ABC} - S_{ADE} = 3,5 \sin A = 1,75$

$\sin A = \frac{1}{2}$ — $A = 30°$

$\tan 30° = \frac{\sqrt{3}}{3}$

سوال ۳ =>

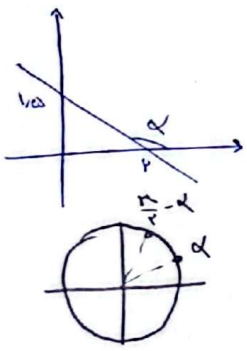
$\frac{1}{\sqrt{\cos^2\alpha}} - \tan\alpha = \frac{1+\sin\alpha}{|\cos\alpha|} \rightarrow (1)$, $\frac{|\sin\alpha|}{\cos\alpha} = -\frac{1}{\cot\alpha} \rightarrow (2)$

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

$(2) \Rightarrow \frac{|\sin\alpha|}{\cos\alpha} = -\frac{\sin\alpha}{\cos\alpha} \longrightarrow \sin\alpha < 0$ (II)

(I) ∩ (II) → نامعین

سوال ۴ =>



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

$(2,0) \longrightarrow y = ax + \frac{3}{2} \rightarrow 2a + \frac{3}{2} = 0 \rightarrow a = -\frac{3}{4}$

$(0, \frac{3}{2}) \longrightarrow b = \frac{3}{2}$

$\Rightarrow y = -\frac{3}{4}x + \frac{3}{2}$

شیب = $\tan\alpha$

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

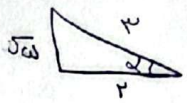
نامعین تغییر نمی‌کند

سوال ۵ =>

$\frac{3\cos(248°) - 2\sin(158°)}{\sin(202°) - \cos(292°)} = \frac{3\cos(270-22) - 2\sin(180-22)}{\sin(180+22) - \cos(270+22)} = \frac{-3\sin 22° - 2\sin 22°}{-\sin 22° - \sin 22°} = \frac{-5\sin 22°}{-2\sin 22°} = \frac{5}{2}$

سوال ۴

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



$$=\frac{4(2-\sqrt{5})}{3}$$

سوال ۷

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

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

$\sin^2\alpha=(2\cos\alpha)^2$

سوال ۸

$2mx+(m^2-1)y=3$

$$y=\frac{-2m}{m^2-1}x+\frac{3}{m^2-1}$$

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

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

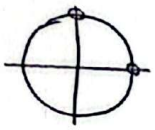
$$m'=-3 \longrightarrow m=\frac{-3}{\sqrt{3}}$$

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

سوال ۹

$\tan(\frac{\pi}{3}-\pi)=\frac{1-m}{2+m}$ ، $-\frac{\pi}{3}<2\pi<\frac{\pi}{2}$

$-\frac{\pi}{4}<\pi<\frac{\pi}{2} \longrightarrow 0<\frac{2\pi}{3}-\pi<\frac{\pi}{2}$



$\tan>0$ در این بازه

$\tan(\frac{\pi}{3}-\pi)=\frac{1-m}{2+m}>0$

	-2		1
$1-m$	+	+	-
$2+m$	-	+	+

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

سوال ۱۰

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

$\tan(300^\circ)\cos(210^\circ)+\tan(180+300^\circ)\sin(4\times 180+240)$

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