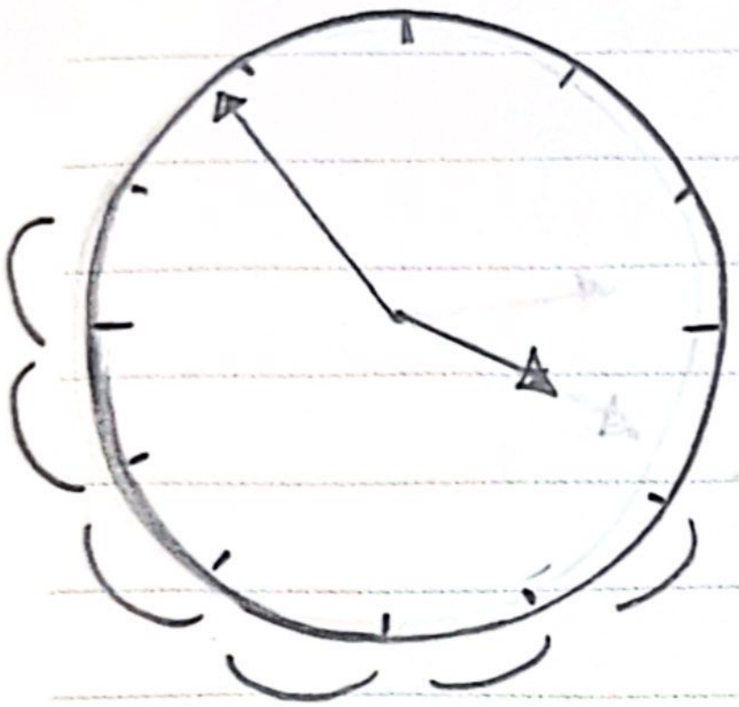


سؤال ۱)

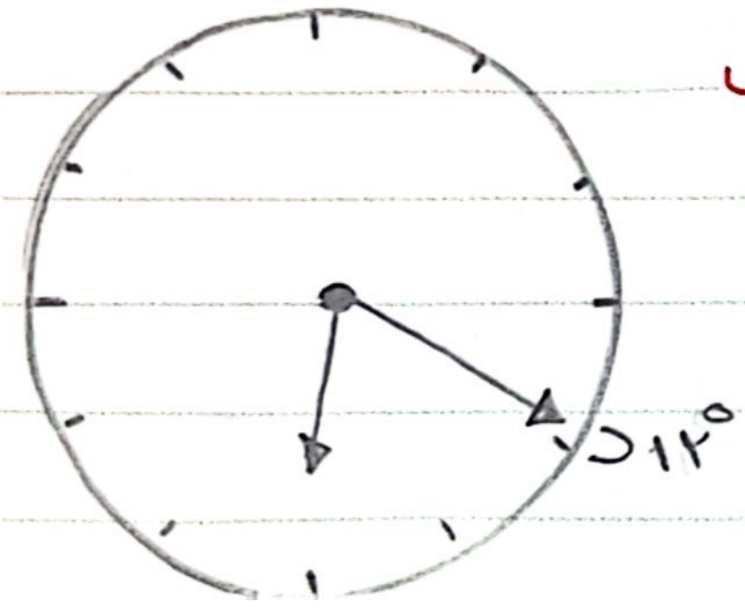
الف) $(۶\times۳۰)+(۴\times۹)+(۳۰-۲۷)=۲۰۷^\circ$

$=۳۶۰-۲۰۷=\boxed{۱۵۳^\circ}$

ب) $\alpha=|۵,۵۳-۳۰h|=|۵,۵(۵۴)-۳۰(۳)|$

$=۲۰۷\longrightarrow ۳۶۰-۲۰۷=\boxed{۱۵۳^\circ}$

سؤال ۲)



الف) $(۲\times۱۲۵^\circ)+(۲\times۹^\circ)+۹=\boxed{۸۱^\circ}$

ب) $\alpha=|۵,۵۳-۳۰h|=|۵,۵(۱۸)-۳۰(۶)|$

$=|۹۹-۱۸۰|=\boxed{۸۱^\circ}$

Scanned with CamScanner

سؤال ۳)

الف) $S = \frac{\alpha}{2} R^2 \xrightarrow{\alpha = \frac{\pi}{4},\ R=3} S = \frac{\frac{\pi}{4}}{2} \cdot (3)^2 = \frac{\pi}{12} \times 9 = \frac{3\pi}{4} cm^2$

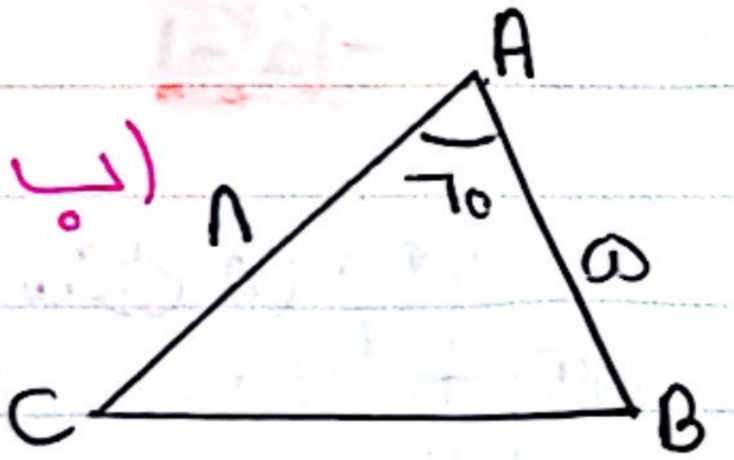
ب) $\frac{1}{2}$ محیط $= \alpha R + 2R \rightsquigarrow \left(\frac{\pi}{4} \times 3\right) + (2 \times 3) = \frac{\pi}{2} + 6$

سؤال ۴)

الف) $S = \frac{1}{2} \cdot a \cdot b \cdot \sin\alpha$

$\rightarrow \frac{1}{2} \times 8 \times 5 \times \sin 60 = \frac{1}{2} \times 8 \times 5 \times \frac{\sqrt{3}}{2} = 10\sqrt{3}$

ب)



$a = \sqrt{c^2 + b^2 - 2bc\cos\alpha}$

$a = \sqrt{2^2 + 6^2 - (2 \times 8 \times 5 \times \cos 60)}$

a

$a = \sqrt{25 + 36 - 40} = \sqrt{49} = 7$

محیط $\rightarrow 8 + 5 + 7 = 20$

$\hat{B} + \hat{C} = 120 \rightarrow \hat{A} = 60^\circ$

سؤال ۵)

$\frac{a}{\sin A} = \frac{b}{\sin B} \rightarrow \frac{10}{\frac{\sqrt{3}}{2}} = \frac{10\sqrt{2}}{\sin B} \rightarrow \sin B = \frac{\sqrt{2}}{2} \rightarrow \hat{B} = 45^\circ$

$\hat{B} = \frac{\pi}{4}$

$\hat{B} + \hat{C} = 120 \xrightarrow{\hat{B} = 45^\circ} \hat{C} = 120^\circ - 45^\circ = 105^\circ$

$\frac{10}{180} = \frac{R}{\pi} \rightarrow R = \frac{7\pi}{12} = \hat{C}$

سؤال ٦)

$$\frac{-\tan\alpha + 3\tan\alpha}{-\tan\alpha - \tan\alpha} = \frac{2\tan\alpha}{-2\tan\alpha} = \boxed{-1}$$

سؤال ٧)

$$\frac{2\tan\left(\frac{\pi}{2}-15\right) + \tan\left(\frac{\pi}{2}+15\right)}{3\tan(\pi-15) - \tan\left(\frac{3\pi}{2}-15\right)} \longrightarrow \frac{\pi}{12\pi} = \frac{\bigcirc}{180} \longrightarrow = 15^\circ$$

$$\longrightarrow \frac{+2\cot(15^\circ) - \cot(15^\circ)}{-2\tan(15^\circ) - \cot(15^\circ)} = \frac{\frac{1}{a}}{\frac{-3a^2+1}{a}} = \boxed{\frac{1}{-3a^2-1}}$$

سؤال ٨)

$$\frac{(\sin x+\cos x)^2 + (\sin x-\cos x)^2}{(\sin x-\cos x)(\sin x+\cos x)} = \frac{2(\sin^2 x+\cos^2 x)}{\sin^2 x-\cos^2 x} = \frac{2}{\sin^2 x-\cos^2 x} = 2$$

$$\longrightarrow \sin^2 x - \cos^2 x = \frac{2}{3} \longrightarrow (1-\cos^2 x) - \cos^2 x = \frac{2}{3} \longrightarrow \cos^2 = \frac{1}{4}$$

$$\sin^2 x = 1-\cos^2 x = 1-\frac{1}{4} = \frac{3}{4} \Longrightarrow \tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{3}{4}}{\frac{1}{4}} = \boxed{3}$$

سؤال ٩)

$$\frac{\sin^2 x - \cos^2 x + 1 - \cos^2 x}{\sin^2 x + \cos^2 x - (1-\cos^2 x)} = \frac{2\sin^2 x - \cos^2 x}{\cos^2 x} = 4$$

$$= 2\sin^2 x - \cos^2 x = 4\cos^2 x \longrightarrow 3\cos^2 x = 2\sin^2 x \longrightarrow \frac{\sin^2 x}{\cos^2 x} = \tan^2 x = \boxed{\frac{3}{2}}$$

سؤال ١٠)

الف)

$$\cos^2\alpha = \frac{1+\cos 2\alpha}{2}$$

$$\longrightarrow \cos^2(22{,}5^\circ) = \frac{1+\cos 45^\circ}{2} = \frac{2+\sqrt{2}}{4}$$

$$\searrow \cos(22{,}5^\circ) = \frac{\sqrt{2+\sqrt{2}}}{2}$$

ب)

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

$$\longrightarrow \sin^2(67{,}5) = \frac{1+\cos 135^\circ}{2} = \frac{2+\sqrt{2}}{4}$$

$$\searrow \sin(67{,}5) = \frac{\sqrt{2+\sqrt{2}}}{2}$$