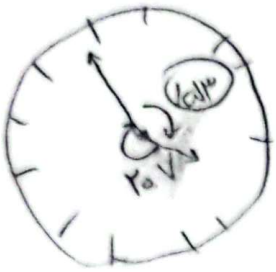
۱)



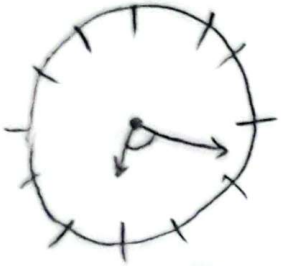
۳:۵۴

الف:

$\theta = |۱۲h - ۵/۵m| \rightarrow |۹۰ - ۵/۵ \times ۵۴| = \theta$

$\theta = ۲۵V$ ب:

۲)



۹:۱۸

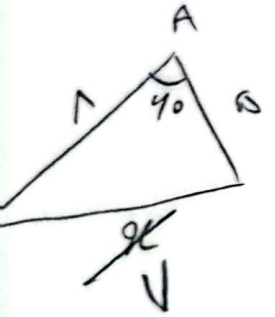
$\theta = |۳۰ \times ۹ - ۵/۵ \times ۱۸)| = \overline{۱۱۰}$

۳)

$S = \frac{۱}{۲}\theta r^۲ \rightarrow \frac{۱}{۲} \times \frac{\pi}{۶} \times (۳)^۲ = \frac{۳\pi}{۴}$

$P = \theta r + ۲r \Rightarrow \frac{\pi}{۴} \times ۳ + ۹ = \frac{\pi}{۲} + ۹$

۴)

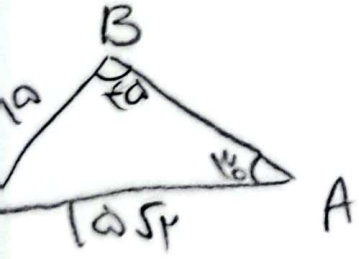


$S = \frac{۱}{۲} \times ۸ \times ۵ \times \frac{\sqrt{۳}}{۲} = ۱۰\sqrt{۳}$

$P \Rightarrow \quad ۹x = \sqrt{۲۵ + ۹۶ - ۸۰ \times \frac{۱}{۲}} = V$

$V + ۸ + ۵ = ۲۰ \qquad ۸۹ - ۴۰ = ۴۹$

۵)



$\hat{B} + \hat{C} = ۱۵۰$

$\frac{\sin ۳۰}{۱۰} = \frac{\sin B}{۱۰\sqrt{۲}} \rightarrow \frac{۱}{۲} = \frac{\sin B}{\sqrt{۲}}$

$\sin B = \frac{\sqrt{۲}}{۲}$

$B = ۴۵°$

$C = ۱۰۵° = ۱۰۵ \times \frac{\pi}{۱۸۰} = \frac{۳۵\pi}{۶۰} = \frac{۷\pi}{۱۲}$

(۴ $\frac{\tan(\pi-\alpha)+۳\tan(\pi+\alpha)}{\tan(۲\pi-\alpha)-\tan(۲\pi+\alpha)} =$

$\frac{\tan(-\alpha)+۳\tan(\alpha)}{\cot(-\alpha)-\cot(+\alpha)} = \frac{-\tan\alpha+۳\tan\alpha}{\cot\alpha-\cot\alpha} =$ (۵

(۷ $\tan\frac{\pi}{۱۲}=a \quad A=\frac{۲\tan۷۵^\circ+\tan۱۰^\circ}{۳\tan۱۶۵^\circ-\tan۲۵^\circ} =$

$\frac{\pi}{۱۲}\times\frac{۱۸۰}{\pi}=۱۵^\circ \quad \frac{۲\tan۷۵^\circ-\tan۷۵^\circ}{-۳\tan۱۵^\circ+\tan۷۵^\circ} \to \frac{۲\tan(۳۰^\circ)}{-۳\tan a-\tan^۳ a}$

(۸ $\frac{\sin\alpha+\cos\alpha}{\sin\alpha-\cos\alpha}+\frac{\sin\alpha-\cos\alpha}{\sin\alpha+\cos\alpha}=۲ \quad \tan^۲\alpha=?$

$\frac{\sin^۲\alpha+\cos^۲\alpha+۲\sin\alpha\cos\alpha+\sin^۲\alpha\cos^۲\alpha-۲\sin\alpha\cos\alpha}{\sin^۲\alpha-\cos^۲\alpha}=۳$

$\sin^۲\alpha-\cos^۲\alpha=۱$

$\frac{۲(\sin^۲\alpha+\cos^۲\alpha)}{\sin^۲\alpha-\cos^۲\alpha}=۳ \quad \sin^۲\alpha+\cos^۲\alpha=۲$

$\frac{\sin^۲\alpha+\cos^۲\alpha}{\sin^۲\alpha-\cos^۲\alpha}=\frac{۳}{۲} \xrightarrow{\div\cos^۲\alpha}$

$۳\tan^۲\alpha-۳=۳\tan^۲\alpha+۳ \quad \frac{\tan^۲\alpha+۱}{\tan^۲\alpha-۱}=\frac{۳}{۲}\to$

$\tan^۲\alpha=۵$

$\frac{\sin^۲\alpha-۳\cos^۲\alpha+۱}{۳\sin^۲\alpha+۳\cos^۲\alpha-۲}=\varepsilon \quad \frac{۲\sin^۲\alpha-\cos^۲\alpha}{\cos^۲\alpha}=\varepsilon$ (۹

$\frac{۲\tan^۲\alpha-۱}{۱}=\varepsilon \to \tan^۲\alpha=\frac{۵}{۲}$

$\cos(22.5) = \cos\left(\frac{45}{2}\right) = \sqrt{\frac{1-\frac{\sqrt{2}}{2}}{2}} \overset{+}{\text{چون ربع اول}} \sqrt{\frac{2+\sqrt{2}}{4}} =$ (10

$$\frac{\sqrt{2+\sqrt{2}}}{2}$$

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

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

$\sin 67.5 = \sin\left(\frac{135}{2}\right) \rightarrow \sqrt{\frac{1-\frac{\sqrt{2}}{2}}{2}} \overset{+}{\text{چون ربع اول}} \sqrt{\frac{2-\sqrt{2}}{2}}$