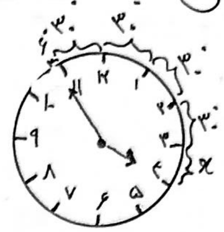
دهم دختر B

نیکا تابش

۱- الف)



$x = \frac{54}{2} = 27° \Rightarrow$

$27 + 6 + (4 \times 30) = \boxed{153°}$

ب) $\alpha = |30h - 5.5m| = |(30 \times 3) - 5.5(54)| = |-207| = 207° \Rightarrow$

$360 - 207 = \boxed{153°}$

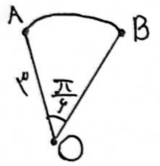
۲- الف)

$x = \frac{18}{2} = 9° \Rightarrow$

$9 + (2 \times 6) + (2 \times 30) = \boxed{81°}$

ب) $\alpha = |30h - 5.5m| = |(30 \times 6) - (5.5 \times 18)| = |81| = \boxed{81°}$

۳-

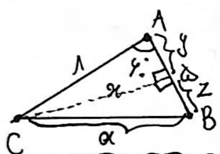


الف) $S = \frac{\alpha}{2} R^2 = \frac{\frac{\pi}{6}}{2} \times 3^2 = \frac{\pi}{12} \times 9 = \boxed{\frac{3\pi}{4}}$

ب) $P = \alpha R + 2R = \frac{\pi}{6} \times 3 + 2 \times 3 = \boxed{\frac{\pi}{2} + 6}$

۴- الف) $S_{\overset{\triangle}{ABC}} = \frac{1}{2} bc \sin A = \frac{1}{2} \times 8 \times 5 \times \frac{\sqrt{3}}{2} = \boxed{10\sqrt{3}}$

ب)

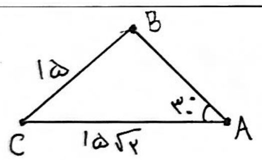


$\sin 60° = \frac{\sqrt{3}}{2}$

$x = \frac{\sqrt{3}}{2} \times 8 = 4\sqrt{3} \Rightarrow y = \sqrt{8^2 - (4\sqrt{3})^2} = 4 \Rightarrow$

$z = 5 - 4 = 1 \Rightarrow a = \sqrt{(4\sqrt{3})^2 + 1^2} = 7$

۵-



$\hat{B} + \hat{C} = 150 \Rightarrow \hat{A} = 180 - 150 = 30° \Rightarrow \frac{a}{\sin A} = \frac{b}{\sin B} \Rightarrow \frac{15}{\frac{1}{2}} = \frac{15\sqrt{2}}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2} \Rightarrow B = \begin{cases} 45° ✓ \\ 135 ✗ \end{cases}$

زاویه حاده است

$\Rightarrow \boxed{\hat{B} = \frac{\pi}{4}}, \quad \hat{C} = 180 - (30 + 45) = 105° \Rightarrow \frac{105}{180} = \frac{Rad}{\pi} \Rightarrow \boxed{\hat{C} = \frac{7\pi}{12}}$

۶- $\frac{\tan(\pi - \alpha) + 3\tan(\pi + \alpha)}{\tan(2\pi - \alpha) - \tan(2\pi + \alpha)} = \frac{-\tan(\alpha) + 3\tan(\alpha)}{-\tan(\alpha) - \tan(\alpha)} = \frac{2\cancel{\tan(\alpha)}}{-2\cancel{\tan(\alpha)}} = -1$

۷- $\frac{\frac{\pi}{12}}{\frac{\pi}{1}} = \frac{D}{180} \Rightarrow D = 15° \Rightarrow A = \frac{2\tan 75 + \tan 105}{3\tan 165 + \tan 255} = \frac{2\tan(\frac{\pi}{2} - a) + \tan(\frac{\pi}{2} + a)}{3\tan(\pi - a) - \tan(\frac{3\pi}{2} - a)} = \frac{2\cot(a) - \cot(a)}{-3\tan(a) - \cot(a)} =$

$\frac{\cot(a)}{-3\tan(a) - \cot(a)} = \frac{\frac{1}{a}}{-3a - \frac{1}{a}} = \frac{\frac{1}{\cancel{a}}}{\frac{-3a^2 - 1}{\cancel{a}}} = \boxed{\frac{1}{-3a^2 - 1}}$

۸-

$$\frac{\sin x+\cos x}{\sin x-\cos x}+\frac{\sin x-\cos x}{\sin x+\cos x}=۳ \Rightarrow \frac{(\sin x+\cos x)(\sin x+\cos x)+(\sin x-\cos x)(\sin x-\cos x)}{(\sin x-\cos x)(\sin x+\cos x)}=۳\Rightarrow$$

$$\frac{\overbrace{\sin^۲+\cos^۲}^{۱}+۲\cancel{\sin\cos}+\overbrace{\sin^۲+\cos^۲}^{۱}-۲\cancel{\sin\cos}}{\sin^۲-\cos^۲}=۳ \Rightarrow ۲=۳(\sin^۲-\cos^۲)\Rightarrow \sin^۲=\frac{۲}{۳}+\cos^۲ \Rightarrow \sin^۲+\cos^۲=۱\Rightarrow$$

$$\frac{۲}{۳}+\cos^۲+\cos^۲=۱\Rightarrow \cos^۲=\frac{۱}{۶}\Rightarrow \sin^۲=\frac{۲}{۳}+\frac{۱}{۶}=\frac{۵}{۶}\Rightarrow \tan^۲=\frac{\frac{۵}{\cancel{۶}}}{\frac{۱}{\cancel{۶}}}=۵$$

۹-

$$\frac{\sin^۲x-۲\cos^۲x+۱}{\sin^۲x+۲\cos^۲x-۱}=۴\Rightarrow \frac{۱-\cos^۲x-۲\cos^۲x+۱}{۱-\cos^۲x+۲\cos^۲x-۱}=۴\Rightarrow ۷\cos^۲=۲\Rightarrow \cos^۲=\frac{۲}{۷}\Rightarrow \sin^۲=۱-\frac{۲}{۷}=\frac{۵}{۷}\Rightarrow \tan^۲=\frac{\frac{۵}{\cancel{۷}}}{\frac{۲}{\cancel{۷}}}=\frac{۵}{۲}$$

۱۰-

الف) $\cos(۲۲٫۵^\circ)\Rightarrow \cos^۲\alpha=\frac{۱+\cos۲\alpha}{۲}\Rightarrow \cos^۲۲۲٫۵=\frac{۱+\cos۴۵}{۲}=\frac{۱+\frac{\sqrt{۲}}{۲}}{۲}=\frac{\frac{۲+\sqrt{۲}}{۲}}{\frac{۲}{۱}}=\frac{۲+\sqrt{۲}}{۴}\Rightarrow$

$$\cos ۲۲٫۵=\sqrt{\frac{۲+\sqrt{۲}}{۴}}=\frac{\sqrt{۲+\sqrt{۲}}}{۲}$$

ب) $\sin(۶۷٫۵^\circ)\Rightarrow \sin^۲\alpha=\frac{۱-\cos۲\alpha}{۲}\Rightarrow \sin^۲۶۷٫۵=\frac{۱-\cos۱۳۵}{۲}=\frac{۱-(-\frac{\sqrt{۲}}{۲})}{۲}=\frac{۲+\sqrt{۲}}{۴}\Rightarrow$

$$\sin ۶۷٫۵=\frac{\sqrt{۲+\sqrt{۲}}}{۲}$$