دهم دختر B

۲۰ آذر ☆

تیکا تابش

۱- الف)

$x = \frac{\Delta \times 6}{2} = 27^\circ$

$27 + 6 \times (30) = \boxed{147^\circ}$

ب)

$\alpha = |30h - 5.5m| = |(30 \times 4) - 5.5(6)| = |-270| = 270^\circ$

$360 - 270 = \boxed{147^\circ}$

۲- الف)

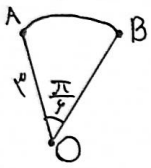
$x = \frac{18}{2} = 9^\circ$

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

ب)

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

۳- الف)

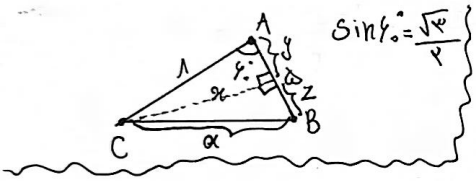


$S = \frac{\alpha}{2} R^2 = \frac{\frac{\pi}{6}}{2} \times 4^2 = \frac{\pi}{12} \times 16 = \boxed{\frac{4\pi}{3}}$

ب)

$P = \alpha R + 2R = \frac{\pi}{6} \times 4 + 2 \times 4 = \boxed{\frac{\pi}{3} + 8}$

۴- الف)



$\sin 60^\circ = \frac{\sqrt{3}}{2}$

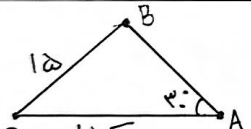
$x = \frac{\sqrt{3}}{2} \times 8 = 4\sqrt{3} \Rightarrow y = \sqrt{8^2 - (4\sqrt{3})^2} = 4$

$z = 5 - 4 = 1 \Rightarrow \alpha = \sqrt{(4\sqrt{3})^2 + 1^2} = \sqrt{49} = 7$

محیط = ۵ + ۷ + ۸ = ۲۰

$S_{ABC} = \frac{1}{2} bc \sin A = \frac{1}{2} \times 8 \times 5 \times \frac{\sqrt{3}}{2} = \boxed{10\sqrt{3}}$

۵-



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

زاویه حاده است

$\Rightarrow \boxed{\hat{B} = \frac{\pi}{4}}, \hat{C} = 180 - (30 + 45) = 105^\circ \Rightarrow \frac{10\sqrt{3}}{180} = \frac{Rad}{\pi} \Rightarrow \boxed{\hat{C} = \frac{7\pi}{12}}$

۶-

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

۷-

$$\frac{\frac{\pi}{12}}{\frac{-\pi}{12}} = \frac{D}{180} \Rightarrow D = 15^\circ \Rightarrow A = \frac{2\tan 75^\circ + \tan 150^\circ}{3\tan 165^\circ + \tan 225^\circ} = \frac{2\tan\left(\frac{\pi}{2} - \alpha\right) + \tan\left(\frac{\pi}{2} + \alpha\right)}{3\tan(\pi - \alpha) - \tan\left(\frac{3\pi}{2} - \alpha\right)} = \frac{2\cot(\alpha) - \cot(\alpha)}{-3\tan(\alpha) - \cot(\alpha)} =$$

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

-٨

$$\frac{\sin x+\cos x}{\sin x-\cos x}+\frac{\sin x-\cos x}{\sin x+\cos x}=٣ \Rightarrow \frac{(\sin x+\cos x)(\sin x+\cos x)+(\sin x-\cos x)(\sin x-\cos x)}{(\sin x-\cos x)(\sin x+\cos x)}=٣ \Rightarrow$$

$$\frac{\overbrace{\sin^٢+\cos^٢}^{1}+٢\sin\cos+\overbrace{\sin^٢+\cos^٢}^{1}-٢\sin\cos}{\sin^٢-\cos^٢}=٣ \Rightarrow ٢=٣(\sin^٢-\cos^٢) \Rightarrow \sin^٢=\frac{٢}{٣}+\cos^٢ \Rightarrow \sin^٢+\cos^٢=١ \Rightarrow$$

$$\frac{٢}{٣}+\cos^٢+\cos^٢=١ \Rightarrow \cos^٢=\frac{١}{٣} \Rightarrow \sin^٢=\frac{٢}{٣}+\frac{١}{٣}=\frac{٣}{٣} \Rightarrow \tan^٢=\frac{\frac{٣}{٣}}{\frac{١}{٣}}=٣$$

-٩

$$\frac{\sin^٢x-٢\cos^٢x+١}{\sin^٢x+٢\cos^٢x-١}=٤ \Rightarrow \frac{١-\cos^٢x-٢\cos^٢x+١}{١-\cos^٢x+٢\cos^٢x-١}=٤ \Rightarrow ٧\cos^٢=٢ \Rightarrow \cos^٢=\frac{٢}{٧} \Rightarrow \sin^٢=١-\frac{٢}{٧}=\frac{٣}{٧} \Rightarrow \tan^٢=\frac{\frac{٣}{٧}}{\frac{٤}{٧}}=\frac{٣}{٤}$$

-١٠

الف) $\cos(٢٢,٥^\circ) \Rightarrow \cos^٢\alpha=\frac{١+\cos٢\alpha}{٢} \Rightarrow \cos^٢٢,٥=\frac{١+\cos٤٥}{٢}=\frac{١+\frac{\sqrt{٢}}{٢}}{٢}=\frac{\frac{٢+\sqrt{٢}}{٢}}{\frac{٤}{١}}=\frac{٢+\sqrt{٢}}{٤} \Rightarrow$

$$\cos٢٢,٥=\sqrt{\frac{٢+\sqrt{٢}}{٤}}=\frac{\sqrt{٢+\sqrt{٢}}}{٢}$$

ب) $\sin(٦٧,٥^\circ) \Rightarrow \sin^٢\alpha=\frac{١-\cos٢\alpha}{٢} \Rightarrow \sin^٢٦٧,٥=\frac{١-\cos١٣٥}{٢}=\frac{١-(-\frac{\sqrt{٢}}{٢})}{٢}=\frac{٢+\sqrt{٢}}{٤} \Rightarrow$

$$\sin٦٧,٥=\frac{\sqrt{٢+\sqrt{٢}}}{٢}$$