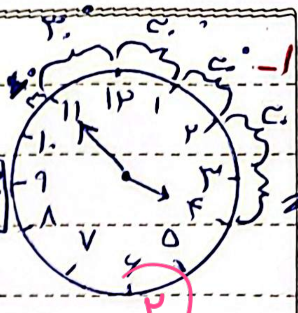
Subject.
Day. Month. Year.

☆ ۲۰ آذر — الناسیبانی

۱- الف)



$x=\frac{54}{2}=27^\circ$

$\Rightarrow 27+4(4\times30)=153^\circ$

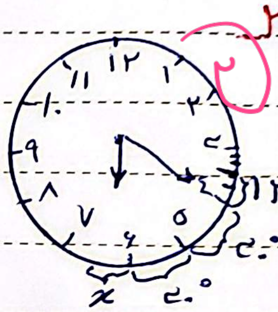
ب)

$\alpha=|30h-5/5m|=$

$|(30\times3)-5/5(54)|=|-207|$

$=207^\circ \Rightarrow 360-207=153^\circ$

۲- الف)



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

$\Rightarrow 9+(2\times6)+(2\times30)$

$=81^\circ$

ب)

$\alpha=|30h-5/5m|$

$=|(30\times6)-(5/5\times18)|$

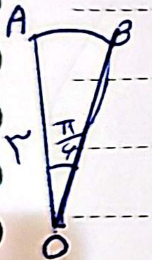
$=|81|=81^\circ$

۳- الف)

$S=\frac{\alpha}{2}R^2=\frac{\frac{\pi}{6}}{\frac{2}{1}}\times3^2=$

$\frac{\pi}{12}\times9=\frac{3\pi}{4}$

ب)



$P=\alpha R+2R=\frac{\pi}{6}\times3+2\times3$

$=\frac{\pi}{2}+6$

۴- الف)

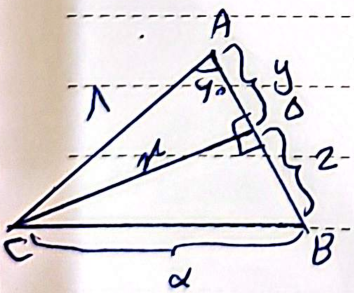
$S_{\triangle ABC}=\frac{1}{2}bc\sin A$

$=\frac{1}{2}\times8\times5\times\frac{\sqrt3}{2}$

$=10\sqrt3$

$P=5+8+7=20$

ب)



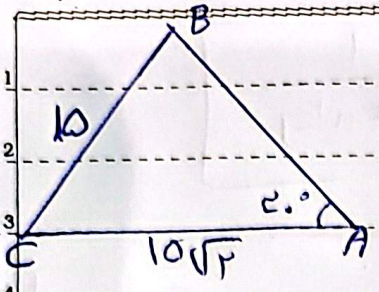
$\sin60^\circ=\frac{\sqrt3}{2}$

$x=\frac{\sqrt3}{2}\times8=4\sqrt3 \Rightarrow y=\sqrt{8^2-(4\sqrt3)^2}=4$

$\Rightarrow z=5-4=1 \Rightarrow a=\sqrt{(4\sqrt3)^2+1^2}=7$

Subject.....

Day.....Month.....Year.....



$\hat{B} + \hat{C} = 120^\circ \Rightarrow \hat{A} = 180^\circ - 120^\circ = 60^\circ$ ـ۱

$\Rightarrow \frac{a}{\sin A} = \frac{b}{\sin B} \Rightarrow \frac{10}{\frac{\sqrt{3}}{2}} = \frac{10\sqrt{2}}{\sin B}$

$\Rightarrow \sin B = \frac{\sqrt{2}}{2} \Rightarrow B = \begin{cases} 45^\circ \checkmark \\ 135^\circ \times \end{cases}$ ـ۲

زاویه حاده است.

$\Rightarrow \boxed{\hat{B} = \frac{\pi}{4}}, \hat{C} = 180^\circ - (60^\circ + 45^\circ) = 75^\circ \Rightarrow \frac{75}{180} = \frac{Rad}{\pi}$

$\Rightarrow \boxed{\hat{C} = \frac{5\pi}{12}}$ ✓

ـ۶

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

$$= \frac{2\tan(\alpha)}{-2\tan(\alpha)} = \boxed{-1}$$ ✓ ۲

ـ۷

$$\frac{\frac{\pi}{12}}{\frac{-\pi}{4}} = \frac{D}{180^\circ} \Rightarrow D = 10^\circ \Rightarrow A = \frac{2\tan 50 + \tan 10}{2\tan 190 + \tan 250}$$

$$= \frac{2\tan(\frac{\pi}{2} - a) + \tan(\frac{\pi}{2} + a)}{2\tan(\pi - a) - \tan(\frac{3\pi}{2} - a)} = \frac{2\cot(a) - \cot(a)}{-2\tan(a) - \cot(a)}$$

۲

Subject.....

Day.... Month.... Year.....

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

$$\frac{\sin x+\cos x}{\sin x-\cos x}+\frac{\sin x-\cos x}{\sin x+\cos x}=2 \quad -8$$

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

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

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

$$\Rightarrow \sin^2 x=\frac{2}{2}+\cos^2 x+\cos^2 x=1 \Rightarrow \cos^2 x=\frac{1}{6} \Rightarrow \sin^2 x=\frac{2}{2}+\frac{1}{6}=\frac{5}{6}$$

$$\Rightarrow \tan^2 x=\frac{\frac{5}{6}}{\frac{1}{6}}=5$$

$$\frac{\sin^2 x-2\cos^2 x+1}{\sin^2 x+2\cos^2 x-1}=2 \Rightarrow \frac{1-\cos^2 x-2\cos^2 x+1}{1-\cos^2 x+2\cos^2 x-1}=2 \quad -9$$

$$\Rightarrow 7\cos^2 x=2 \Rightarrow \cos^2 x=\frac{2}{7} \Rightarrow \sin^2 x=1-\frac{2}{7}=\frac{5}{7}$$

$$\Rightarrow \tan^2 x=\frac{\frac{5}{7}}{\frac{2}{7}}=\frac{5}{2}$$

$$\text{الف) } \cos(22.5^\circ) \Rightarrow \cos^2\alpha=\frac{1+\cos 2\alpha}{2} \Rightarrow \cos^2 22.5=\frac{1+\cos 45}{2} \quad -10$$

$$\frac{1+\frac{\sqrt{2}}{2}}{2}=\frac{\frac{2+\sqrt{2}}{2}}{2}=\frac{2+\sqrt{2}}{4} \Rightarrow \cos 22.5=\sqrt{\frac{2+\sqrt{2}}{4}}=\frac{\sqrt{2+\sqrt{2}}}{2}$$

Subject.....

Day....Month....Year.....

ب) $\sin(22.5^\circ) \Rightarrow \sin^2\alpha = \frac{1-\cos 2\alpha}{2}$

$\Rightarrow 2\sin^2 22.5 = \frac{1-\cos 45}{2} = \frac{1-\left(\frac{-\sqrt{2}}{2}\right)}{2} = \frac{2+\sqrt{2}}{4}$

$\Rightarrow \sin 22.5 = \frac{\sqrt{2+\sqrt{2}}}{2}$