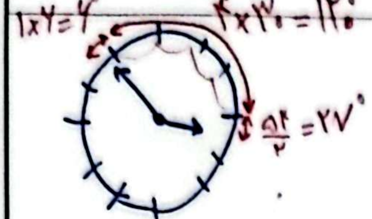
نام و نام خانوادگی .آرتین شیروانی فر. پاسخنامه تشریحی تکلیف شماره ..۱.. کلاس ..۱۹.. میرابی B

۱

الف) ۳:۵۴



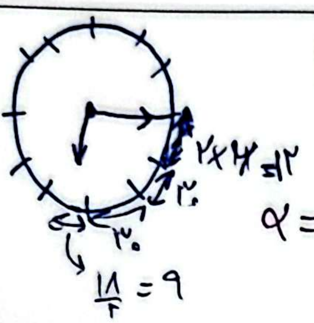
$120+27+6=153^\circ$

ب) $x=|5.5m-30h|=|(5.5\times54)-(30\times3)|=207$

$360-207=153^\circ$

۲

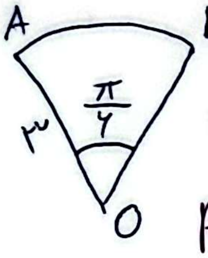
الف) ۶:۱۸



$12+30+30+9=81$

ب) $\alpha=|5.5m-30h|=|\overbrace{(5.5\times18)}^{99}-\overbrace{(30\times6)}^{180}|=81^\circ$

۳

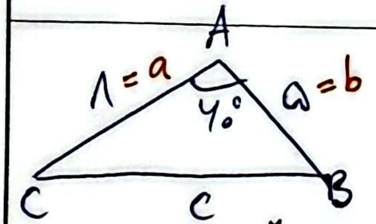


$S=\frac{1}{2}\alpha\times R^2\rightarrow\frac{\frac{\pi}{6}}{2}\times9=\frac{\pi}{12}\times9=\frac{9\pi}{12}=\frac{3\pi}{4}$ S قطاع

$L=R\alpha\rightarrow3\times\frac{\pi}{6}=\frac{3\pi}{6}=\frac{\pi}{2}$

$P=3+3+\frac{\pi}{2}=6+\frac{\pi}{2}$ محیط قطاع

۴



$S=\frac{1}{2}ab\sin\alpha=\frac{1}{2}\times5\times8\times\sin60^\circ$

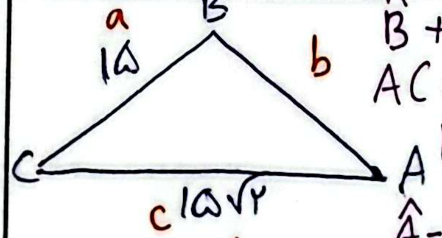
$=\frac{1}{2}\times5\times8\times\frac{\sqrt3}{2}=\frac{20\sqrt3}{2}=10\sqrt3$ مساحت مثلث

$c^2=a^2+b^2-2ab\cos\alpha$

$\Rightarrow c^2=5^2+8^2-2\times5\times8\times\cos60^\circ=\overset{89}{\cancel{25+64}}-\cancel{2}\times5\times8\times\frac{1}{\cancel{2}}=89-40=49$

$c=\sqrt{49}=7\longrightarrow P=5+8+7=20\longrightarrow$ محیط

۵



$\hat B+\hat C=150^\circ$

$AC=15\sqrt2$

$BC=15$

$\hat A=180-150=30^\circ$

$\frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C}$

$\frac{15}{\sin30^\circ}=\frac{15\sqrt2}{\sin B}\rightarrow\frac{15}{\frac{1}{2}}=\frac{15\sqrt2}{\sin B}$

$\sin B=\frac{15\sqrt2}{30}=\frac{\sqrt2}{2}$

$\hat B=45^\circ,\ \hat C=105^\circ$

$\frac{Rad}{\pi}=\frac{D}{180}\longrightarrow B:\frac{Rad}{\pi}=\frac{45}{180}\longrightarrow Rad=\frac{\pi}{4}=\hat B$

$C:\frac{Rad}{\pi}=\frac{105}{180}=\frac{7\pi}{12}=\hat C$

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

$\tan\frac{\pi}{12}=\alpha \rightarrow \tan 15^\circ=\alpha$

$$A=\frac{2\tan 75^\circ+\tan 105^\circ}{3\tan 165^\circ-\tan 255^\circ}=\frac{2\tan(\frac{\pi}{2}-15^\circ)+\tan(\frac{\pi}{2}+15^\circ)}{3\tan(\pi-15^\circ)-\tan(\frac{3\pi}{2}-15^\circ)}=$$

$$\frac{\cancel{2\cot 15^\circ-\cot 15^\circ}^{\ \cot 15^\circ}}{-3\tan 15^\circ-\cot 15^\circ}=\frac{\frac{1}{\alpha}}{-3\alpha-\frac{1}{\alpha}}=\frac{-1}{3\alpha^2+1}$$ ۷

$$\frac{\sin x+\cos x}{\sin x-\cos x}+\frac{\sin x-\cos x}{\sin x+\cos x}=3$$

$\tan^2 x=?$ $$\frac{(\sin x+\cos x)^2+(\sin x-\cos x)^2}{\sin^2 x-\cos^2 x}=\frac{\sin^2+\cos^2+\cancel{2\sin\cos}+\sin^2+\cos^2\cancel{-2\sin\cos}}{\sin^2-\cos^2}$$ ۸

$$\frac{2(\sin^2+\cos^2)}{\sin^2-\cos^2}=\frac{2}{\sin^2-\cos^2}=3\rightarrow 2=3(1-\cos^2)-3\cos^2$$

$$-6\cos^2=-1\rightarrow \boxed{\cos^2=\frac{1}{6}}\qquad 1+\tan^2=\frac{1}{\cos^2}\ \ \boxed{\tan^2=5}$$

$$\frac{\sin^2 x-2\cos^2 x+1}{\sin^2 x+2\cos^2 x-1}=4\xrightarrow{\sin^2=1-\cos^2}\sin^2 x-2\cos^2 x+1=(1-\cos^2 x)-2\cos^2 x+1=2-3\cos^2 x \rightarrow \text{صورت}$$

$$\sin^2 x+2\cos^2 x-1=(1-\cos^2 x)+2\cos^2 x-1=\cos^2 x \ \text{مخرج}$$ ۹

$$\frac{2-3\cos^2 x}{\cos^2 x}=4\rightarrow 2-3\cos^2 x=4\cos^2 x\rightarrow 7\cos^2 x=2\rightarrow \cos^2 x=\frac{2}{7}$$

$$1+\tan^2=\cancel{\frac{1}{\cos^2}}^{\ \frac{7}{2}}\longrightarrow \tan^2=\frac{5}{2}$$

الف) $\cos(22.5^\circ)\rightarrow \cos^2\alpha=\frac{1+\cos 2\alpha}{2}\rightarrow \cos^2 22.5^\circ=\frac{1+\cos 45^\circ}{2}$

$$\cos^2 22.5^\circ=\frac{1+\frac{\sqrt{2}}{2}}{2}\rightarrow \cos 22.5^\circ=\pm\sqrt{\frac{1+\frac{\sqrt{2}}{2}}{2}}=\sqrt{\frac{2+\sqrt{2}}{4}}=\frac{\sqrt{2+\sqrt{2}}}{2}$$ ۱۰

چون در ناحیه اول است پس منفی نیست

ب) $\sin(67.5^\circ)=\cos(22.5^\circ)=\frac{\sqrt{2+\sqrt{2}}}{2}$