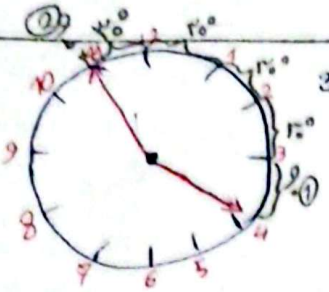
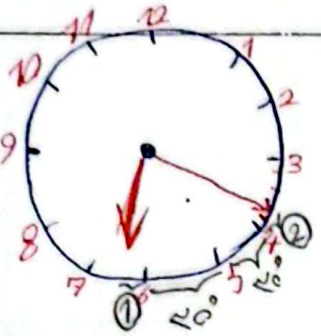
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱۸ کلاس .....



3:54 ② : $1\times4=4^\circ$ ① : $\frac{54}{2}=27^\circ$ $\Rightarrow (4\times30^\circ)+27^\circ+6^\circ=153^\circ$

$\alpha=|\frac{1}{2}M-30H| \Rightarrow \alpha=|(\frac{1}{2}\times54)-(30\times4)|=207 \rightarrow 360-\alpha=270-207=153^\circ$



6:18 ② : $2\times6=12^\circ$ ① : $\frac{18}{2}=9^\circ$ $\Rightarrow (2\times30^\circ)+9^\circ+12^\circ=81^\circ$

$\alpha=|\frac{1}{2}M-30H| \Rightarrow \alpha=|(\frac{1}{2}\times18)-(30\times6)|=|-81|=81^\circ$

ب) $P=$ محیط $=|AB|+2R=\alpha R+2R \Rightarrow \alpha=\frac{\pi}{4}$, $R=3$ $\Rightarrow$ محیط $=(2\times3)+(\frac{\pi}{4}\times3)=6+\frac{3\pi}{4}$ cm

الف) $S_{OAB}=$ مساحت $=\frac{\alpha}{2}R^2 \Rightarrow \alpha=\frac{\pi}{4}$, $R=3$ $\Rightarrow \frac{\pi}{8}\times(3)^2=\frac{9\pi}{8}$ cm^2

الف) $S_{ABC}=\frac{1}{2}\times AB\times AC\times\sin(60^\circ)=\frac{1}{2}\times10\times8\times\frac{\sqrt{3}}{2}=10\sqrt{3}$

ب) $CB^2=AB^2+AC^2-2(AB)(AC)\cos(60^\circ)=25+64-80=49 \Rightarrow$
$(5)^2+(8)^2-2(5)(8)(\frac{1}{2})$

$CB=\sqrt{49}=7 \Rightarrow P=8+5+7=20$

$\frac{AC}{\sin B}=\frac{BC}{\sin A} \Rightarrow \hat{A}=180-(\hat{B}+\hat{C})=180-120=60^\circ \Rightarrow \sin(60^\circ)=\frac{\sqrt{3}}{2} \Rightarrow$

$\frac{10\sqrt{2}}{\sin B}=\frac{10}{\frac{1}{2}} \Rightarrow \sin B=\frac{10\sqrt{2}}{20}=\frac{\sqrt{2}}{2} \Rightarrow \hat{B}=45^\circ \Rightarrow \hat{C}=180-45^\circ=105^\circ \Rightarrow$

$\hat{B}=\frac{\pi}{4}$, $\hat{C}=\frac{7\pi}{12}$

$$\frac{\tan(\pi-\alpha)+3\tan(\pi+\alpha)}{\tan(2\pi-\alpha)-\tan(2\pi+\alpha)}=\frac{-\tan(\alpha)+3\times(\tan(\alpha))}{-\tan(\alpha)-(+\tan(\alpha))}=\frac{2\tan(\alpha)}{-2\tan(\alpha)}=\boxed{-1}$$ ✓ ۲

$$A=\frac{2\tan 75^\circ+\tan 105^\circ}{3\tan 165^\circ-\tan 255^\circ}=\frac{2\times(\tan(90^\circ-15^\circ))+\tan(90^\circ+15^\circ)}{3\times(\tan(180-15^\circ))\quad \tan(270-15^\circ)}=$$

$$\frac{2\left(\tan\left(\frac{\pi}{2}-\frac{\pi}{12}\right)\right)+\tan\left(\frac{\pi}{2}+\frac{\pi}{12}\right)}{3\left(\tan\left(\pi-\frac{\pi}{12}\right)\right)\quad \tan\left(\frac{3\pi}{2}-\frac{\pi}{12}\right)}$$

$2\times\left(\cot\left(\frac{\pi}{12}\right)\right)+\left(-\cot\left(\frac{\pi}{12}\right)\right)$, $3\left(-\tan\left(\frac{\pi}{12}\right)\right)$, $\left(\cot\left(\frac{\pi}{12}\right)\right)$

$$=\frac{2\cot\left(\frac{\pi}{12}\right)-\cot\left(\frac{\pi}{12}\right)}{-\cot\left(\frac{\pi}{12}\right)-3\tan\left(\frac{\pi}{12}\right)}=\frac{\frac{2}{a}-\frac{1}{a}}{-\frac{1}{a}-3a}=\frac{\frac{1}{a}}{\frac{-1-3a^2}{a}}\Rightarrow$$ ۲

$$\cot\alpha=\frac{1}{\tan\alpha}\Rightarrow\cot\left(\frac{\pi}{12}\right)=\frac{1}{a}\;/\;\frac{\frac{1}{a}}{\frac{-1-3a^2}{a}}=\frac{1}{-1-3a^2}=\boxed{-\frac{1}{1+3a^2}}$$ ✓

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۸ سوال:

$$\frac{(\sin x+\cos x)}{(\sin x-\cos x)}\times\frac{(\sin x+\cos x)}{(\sin x+\cos x)}+\frac{(\sin x-\cos x)}{(\sin x+\cos x)}\times\frac{(\sin x-\cos x)}{(\sin x-\cos x)}=3\Rightarrow$$

$$\frac{(\sin x+\cos x)^2+(\sin x-\cos x)^2}{\sin^2 x-\cos^2 x}=\frac{\sin^2 x+\cos^2 x+2\sin x\cos x+\sin^2 x+\cos^2 x-2\sin x\cos x}{\sin^2 x-\cos^2 x}=\frac{2(\sin^2 x+\cos^2 x)}{\sin^2 x-\cos^2 x}$$ ۲

$$\Rightarrow\frac{2(\sin^2 x+\cos^2 x)}{\sin^2 x-\cos^2 x}=\frac{2\times 1}{2\sin^2 x-1}=3\Rightarrow 2\sin^2 x=\frac{2}{3}+\frac{3}{3}=\frac{5}{3}\Rightarrow\sin^2 x=\frac{5}{6}$$

$-\cos^2 x = -(1-\sin^2 x)$

$\cos^2 x=\frac{1}{6}$ ← از رابطه $\sin^2+\cos^2=1$ $\Rightarrow \boxed{\tan^2 x=\frac{5}{1}}$ ✓

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۹ سوال:

$$\frac{\sin^2 x-2\cos^2 x+1}{\sin^2 x+2\cos^2 x-1}=4\Rightarrow\frac{\sin^2 x-2\cos^2 x+\sin^2 x+\cos^2 x}{\sin^2 x+2\cos^2 x-\sin^2 x-\cos^2 x}=4\Rightarrow$$ ۲

$$4\cos^2 x=2\sin^2 x-\cos^2 x\Rightarrow 5\cos^2 x=2\sin^2 x\Rightarrow\boxed{\frac{\sin^2 x}{\cos^2 x}=\frac{5}{2}=\tan^2 x}$$ ✓

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۱۰ سوال:

قسمت الف) : $\cos(22{,}5^\circ)=\cos\left(\frac{45^\circ}{2}\right)\Rightarrow\cos\left(\frac{\alpha}{2}\right)=\pm\sqrt{\frac{1+\cos\alpha}{2}}\Rightarrow\cos\left(\frac{45^\circ}{2}\right)=\pm\sqrt{\frac{1+\cos(45^\circ)}{2}}$

$$=\pm\sqrt{\frac{\frac{2}{2}+\frac{\sqrt{2}}{2}}{2}}=\pm\sqrt{\frac{\frac{2+\sqrt{2}}{2}}{2}}=\boxed{\pm\sqrt{\frac{2+\sqrt{2}}{4}}}$$ ✓ ۲

(مثبت)

قسمت ب) : $\sin(67{,}5^\circ)=\sin\left(\frac{135^\circ}{2}\right)\Rightarrow\sin\left(\frac{\alpha}{2}\right)=\pm\sqrt{\frac{1-\cos\alpha}{2}}\Rightarrow\sin\left(\frac{135^\circ}{2}\right)=\pm\sqrt{\frac{1-\cos 135^\circ}{2}}$

$$=\pm\sqrt{\frac{\frac{2}{2}-\left(-\frac{\sqrt{2}}{2}\right)}{2}}=\pm\sqrt{\frac{\frac{2+\sqrt{2}}{2}}{2}}=\boxed{\pm\sqrt{\frac{2+\sqrt{2}}{4}}}$$ ✓

(مثبت)

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