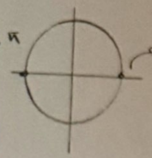
نام و نام خانوادگی ......[illegible]...... پاسخنامه تشریحی تکلیف شماره ...۱۸... کلاس ...دهم ریاضی C...

۱

الف) $\tan(۲\pi+\frac{۳\pi}{۴}) + \sin(۳\pi+\underset{\frac{\pi}{۲}}{\frac{۳\pi}{۴}}) \times \cos(۳\pi+\frac{\pi}{۴}) = \tan(\frac{۳\pi}{۴}) + \sin(\frac{۷\pi}{۴}) \times \cos(\frac{۵\pi}{۴}) =$

$-۱ + (-\frac{\sqrt{۲}}{۲} \times -\frac{\sqrt{۲}}{۲}) = -۱ + \frac{۱}{۲} = -\frac{۱}{۲}$



ب) $\tan(\underset{۰}{\cancel{۲\pi}}+\frac{۵\pi}{۶}) \times \sin(\underset{\pi}{\cancel{۳\pi}}+\frac{۲\pi}{۳}) + \cos(\underset{\pi}{\cancel{۳\pi}}+\frac{\pi}{۳}) = \tan(\frac{۵\pi}{۶}) \times \sin(\frac{۵\pi}{۳}) + \cos(\frac{۴\pi}{۳}) =$

$(-\frac{\sqrt{۳}}{۳} \times -\frac{\sqrt{۳}}{۲}) + (-\frac{۱}{۲}) = \frac{۳}{۶} - \frac{۱}{۲} = ۰$

۲

$\cot x = ۴ \Rightarrow \frac{\cos x}{\sin x} = ۴ \Rightarrow \cos x = ۴\sin x \; (*)$

$\frac{۳\cos x - \sin x}{\cos x + \sin x} \overset{(*)}{=} \frac{۱۲\sin x - \sin x}{۴\sin x + \sin x} = \frac{۱۱\cancel{\sin x}}{۵\cancel{\sin x}} = \frac{۱۱}{۵}$

۳

$\sin\alpha = ۲\cos\alpha \Rightarrow \cos^۲\alpha = ۱ - \sin^۲\alpha \dashrightarrow \cos^۲\alpha = ۱ - (۲\cos\alpha)^۲ \dashrightarrow ۵\cos^۲\alpha = ۱ \dashrightarrow \cos^۲\alpha = \frac{۱}{۵}$

$\sin^۲\alpha + \cos^۲\alpha = ۱ \dashrightarrow \sin^۲\alpha + \frac{۱}{۵} = ۱ \dashrightarrow \sin^۲\alpha = \frac{۴}{۵}$

(ربع ۳) $\xrightarrow{*} \sin\alpha < ۰$, $\cos\alpha < ۰$

$\sin\alpha = \pm\frac{۲}{\sqrt{۵}} \xrightarrow{*} \sin\alpha = -\frac{۲\sqrt{۵}}{۵}$

$\cos\alpha = \pm\frac{۱}{\sqrt{۵}} \xrightarrow{*} \cos\alpha = -\frac{\sqrt{۵}}{۵}$

۴

الف) $\cos(\frac{۱۱\pi}{۴}+\alpha) = \cos(\underset{۰}{\cancel{۲\pi}}+\frac{۳\pi}{۴}+\alpha) = \cos(\alpha+\frac{۳\pi}{۴}) = ?$

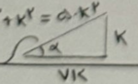
ربع دوم → $\sin\alpha > ۰$, $\cos\alpha < ۰$

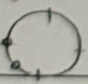
$\sin\alpha = \frac{\sqrt{۲}}{۱۰} \to \sin^۲\alpha = \frac{۲}{۱۰۰}$ $\quad \cos^۲\alpha + \sin^۲\alpha = ۱ \to \cos^۲\alpha = \frac{۹۸}{۱۰۰} \Rightarrow \cos\alpha = -\frac{\sqrt{۹۸}}{۱۰}$

[illegible] $\cos\alpha \times \cos\overset{-\frac{\sqrt{۲}}{۲}}{\cancel{\frac{۳\pi}{۴}}} - \overset{\frac{\sqrt{۲}}{۱۰}}{\cancel{\sin\alpha}} \times \sin\overset{\frac{\sqrt{۲}}{۲}}{\cancel{\frac{۳\pi}{۴}}} = \frac{\sqrt{۹۸\times۲}}{۲۰} - \frac{۲}{۲۰} = \frac{۱۲}{۲۰} = ۰/۶$ جواب

ب) $\sin(\frac{۱۳\pi}{۴}+\alpha) = \sin(۲\pi+\frac{\pi}{۴}+\alpha) = \sin(\frac{۵\pi}{۴}+\alpha) = \sin\overset{-\frac{\sqrt{۲}}{۲}}{\cancel{\frac{۵\pi}{۴}}}\cos\alpha + \cos\overset{-\frac{\sqrt{۲}}{۲}}{\cancel{\frac{۵\pi}{۴}}}\sin\alpha =$

$\tan\alpha = \frac{۱}{۷} \Rightarrow (۷K)^۲ + K^۲ = ۵۰K^۲$





$\sin\alpha = \frac{\sqrt{۲}}{۱۰}$ $\quad \cos\alpha = \frac{۷\sqrt{۲}}{۱۰}$

$(-\frac{\sqrt{۲}}{۲} \times \frac{۷\sqrt{۲}}{۱۰}) + (-\frac{\sqrt{۲}}{۲} \times \frac{\sqrt{۲}}{۱۰}) = -\frac{۱۴}{۲۰} - \frac{۲}{۲۰} = -\frac{۱۶}{۲۰} = -\frac{۸}{۱۰}$

۵

$۲\sin^۲x + \cos^۲x = \frac{۴}{۳} \xrightarrow{\sin^۲x+\cos^۲x=۱} \sin^۲x + \underbrace{\sin^۲x + \cos^۲x}_{۱} = \frac{۴}{۳} \Rightarrow \sin^۲x = \frac{۱}{۳} \to \cos^۲x = \frac{۲}{۳}$

$\tan^۲x = \frac{\sin^۲x}{\cos^۲x} = \frac{\frac{۱}{\cancel{۳}}}{\frac{۲}{\cancel{۳}}} = \frac{۱}{۲}$

۶

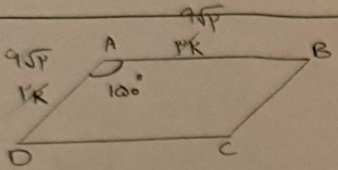
$S_{\overset{\triangle}{ABC}} = \frac{۱}{۲} \times A \times B \times \sin\alpha \rightarrow S_{\triangle} = \frac{۱}{\cancel{۲}_{۱}} \times \overset{۳}{\cancel{۶}} \times \sqrt{۳} \times \sin\alpha = \frac{\cancel{۹}^{۳}}{۲}$

$\sin\alpha = \frac{\overset{\sqrt{۳}}{\cancel{۳}}}{۲} \times \frac{۱}{\cancel{\sqrt{۳}}} = \frac{\sqrt{۳}}{۲} \rightarrow \alpha = ۶۰ , ۱۲۰$

Sin های زاویه های مکمل باهم برابر هستند.

$\frac{۱۲۰}{۶۰}$ ②

۷



$S_{\square} = AB \times AD \times \sin_{۱۵۰} (= \sin_{۳۰}) = ۳K \times ۲K \times \frac{۱}{\cancel{۲}} = \cancel{۵۴}^{۱۰۸}$

$۹K^۲ = ۱۰۸$

$K^۲ = ۱۸ \Rightarrow K = \pm\sqrt{۱۸} \Rightarrow$

$K = ۳\sqrt{۲}$ = طول

$۱۵\sqrt{۲}$ =

$۲ \times (۹\sqrt{۲} + \cancel{۹\sqrt{۲}}) = ۳۰\sqrt{۲}$

۸

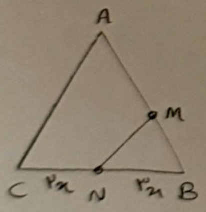
$S_{ABC} = \frac{۱}{۲} \times AB \times AC \times \sin\hat{A} = \frac{۱}{۲} \times ۵ \times ۷ \times \sin\hat{A} = \frac{۳۵}{۲} \sin\hat{A}$

$S_{ADE} = \frac{۱}{۲} \times AE \times AD \times \sin\hat{A} = \frac{۱}{۲} \times ۴ \times ۷ \times \sin\hat{A} = \frac{۲۸}{۲} \sin\hat{A}$

$S_{ABC} - S_{ADE} = \frac{۳۵}{۲} \sin\hat{A} - \frac{۲۸}{۲} \sin\hat{A} = \frac{۷}{۴} \rightarrow \frac{۷}{۲} \sin A = \frac{۷}{۴} \rightarrow \sin A = \frac{۱}{۲}$

$\sin A = \frac{۱}{۲} \xrightarrow{\hat{A} < ۹۰} \hat{A} = ۳۰° \rightarrow \tan_{\hat{A}} = \tan_{۳۰} = \frac{\sqrt{۳}}{۳}$

۹



$۲\overline{BN} = ۳\overline{CN}$

$\frac{S_{ABC}}{S_{BMN}} = \frac{\frac{۱}{\cancel{۲}} \times AB \times \overset{۵x}{\cancel{BC}} \times \cancel{\sin\hat{B}}}{\frac{۱}{\cancel{۲}} \times BM \times \underset{۳x}{\cancel{BN}} \times \cancel{\sin\hat{B}}} = \frac{۵AB}{۳BM} = \frac{۵BM + ۵AM}{\cancel{۳}BM} = \cancel{۳}\,۹ \Rightarrow$

$۵ + \frac{۵AM}{BM} = ۹ \rightarrow \frac{۵AM}{BM} = ۴$

$\frac{AM}{BM} = \frac{۴}{۵} \Rightarrow \frac{BM}{AM} = \frac{۵}{۴}$

۱۰

$\frac{۱}{\sqrt{\cos^۲\alpha}} - \frac{\sin\alpha}{\cos\alpha} = \frac{۱ + \sin\alpha}{|\cos\alpha|} = \frac{۱}{|\cos\alpha|} - \frac{\sin\alpha}{\cos\alpha} = \frac{۱ + \sin\alpha}{|\cos\alpha|} \Rightarrow \cos\alpha < ۰$

ناحیه ۳

$\frac{|\sin\alpha|}{\cos\alpha} = -\tan\alpha \rightarrow \sin\alpha < ۰$