نام و نام خانوادگی ......ملیکا نبی...... ۲۰ پاسخنامه تشریحی تکلیف شماره ۲۸ کلاس یازدهم دختر C

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$\cot\alpha = \dfrac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} = \dfrac{\cos\alpha}{\sqrt{\sin^2\alpha}} = \dfrac{\cos\alpha}{|\sin\alpha|}$ ① $\cot\alpha = \dfrac{\cos\alpha}{\sin\alpha}$ ②

$\xrightarrow{①,②} |\sin\alpha| = \sin\alpha \to \sin\alpha > 0 \to$ ناحیه ۱ و ۲ ★

$\dfrac{1}{\sqrt{\cos^2\alpha}} - \dfrac{1}{\cot\alpha} = \dfrac{1-\sin\alpha}{|\cos\alpha|} \to \dfrac{1}{|\cos\alpha|} - \dfrac{\sin\alpha}{\cos\alpha} = \dfrac{1-\sin\alpha}{|\cos\alpha|} \to \dfrac{\sin\alpha}{|\cos\alpha|} = \dfrac{\sin\alpha}{\cos\alpha}$

$|\cos\alpha| = \cos\alpha \to \cos\alpha > 0 \to$ ناحیه ۱ و ۴ ★ $\to$ $\boxed{\alpha \text{ در ناحیه اول}}$

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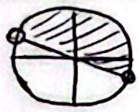
$\dfrac{-\pi}{12} < x < \dfrac{5\pi}{12} \to \dfrac{-\pi}{6} < 2x < \dfrac{5\pi}{6}$



$\to \dfrac{-1}{2} < \sin 2x \leq 1 \ , \ \sin 2x = \dfrac{m-1}{4}$

$\Rightarrow \dfrac{-1}{2} < \dfrac{m-1}{4} \leq 1 \to -2 < m-1 \leq 4 \to \boxed{-1 < m \leq 5}$

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$\tan x + \cot x = -3 \to \dfrac{\sin x}{\cos x} + \dfrac{\cos x}{\sin x} = -3 \to \dfrac{\overbrace{\sin^2 x + \cos^2 x}^{1}}{\sin x \cos x} = -3 \to \sin x \cdot \cos x = \dfrac{-1}{3}$

$3\pi < 4x < 4\pi \to \dfrac{3\pi}{4} < x < \pi \to \left.\begin{array}{l} \sin x > 0 \\ \cos x < 0 \\ |\cos x| > |\sin x| \end{array}\right\} \to \sin x + \cos x < 0$ ①

$(\sin x + \cos x)^2 = \underbrace{\sin^2 x + \cos^2 x}_{1} + \underbrace{2\sin x \cos x}_{-\frac{2}{3}} = \dfrac{1}{3}$ ②

$\dfrac{1}{\sin^3 x + \cos^3 x} = \dfrac{1}{(\sin x + \cos x)(\underbrace{\sin^2 x + \cos^2 x}_{1} - \underbrace{\sin x \cos x}_{-\frac{1}{3}})} = \dfrac{1}{\frac{4}{3}(\sin x + \cos x)} = \dfrac{1}{-\frac{4}{3} \times \frac{1}{\sqrt{3}}} = \dfrac{-3\sqrt{3}}{4}$

$\xrightarrow{①,②} \sin x + \cos x = \dfrac{-1}{\sqrt{3}}$

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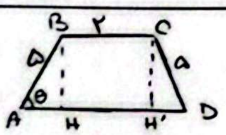

$\cos\theta = 0{,}6 = \dfrac{AH}{\underset{5}{AB}} = \dfrac{DH'}{\underset{5}{CD}} \to AH = DH' = 3 \Big\} \ AD = 3+3+2 = 8$

$BC = HH' = 2$

$\sin\theta = \sqrt{1-\cos^2\theta} = \sqrt{1-0{,}36} = 0{,}8 = \dfrac{BH}{\underset{5}{AB}} \to BH = 4$

$S = \dfrac{(AD+BC) \times BH}{2} = \dfrac{(8+2) \times 4}{2} = 20$

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$\tan(\underset{270+15}{285^\circ}) \tan(\underset{-180+15}{-165^\circ}) - \sin(\underset{3\times 360+15}{1095^\circ}) \cos(\underset{270-15}{255^\circ}) = K\cos^2 15$

$\Rightarrow \underbrace{-\cot(15^\circ) \ \tan(15^\circ)}_{-1} - \sin(15^\circ) \ {-\sin(15^\circ)} = \underbrace{-1 + \sin^2(15^\circ)}_{-(1-\sin^2(15^\circ)) = -\cos^2 15^\circ} = K\cos^2 15^\circ$

$\Rightarrow \boxed{K = -1}$

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$$A = \sqrt{۳}\,\underbrace{\cos(۲۱۰^\circ)}_{-\frac{\sqrt{۳}}{۲}}\,\underbrace{\sin(۲۴۳^\circ)}_{\sin(۲۷۰^\circ-۲۷^\circ)} - \sqrt{۲}\,\underbrace{\sin(۱۳۵^\circ)}_{\frac{\sqrt{۲}}{۲}}\,\underbrace{\cos(۱۵۳^\circ)}_{\cos(۱۸۰^\circ-۲۷^\circ)} = -\frac{۳}{۲}\sin(۲۷۰^\circ-۲۷^\circ) - \cos(۱۸۰^\circ-۲۷^\circ)$$

$$= -\frac{۳}{۲}(-\cos ۲۷^\circ) - (-\cos ۲۷^\circ) = \frac{۳}{۲}\cos ۲۷^\circ + \cos ۲۷^\circ = \frac{۵}{۲}\cos ۲۷^\circ \rightarrow \boxed{\frac{۵}{۲}\ \text{برابر}}$$ ۶

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$$f(x) = ۱۶\cos^۲(۳x)\cos^۲(۶x)\cos^۲(۱۲x)\cos^۲(۲۴x)$$

$$f\left(\frac{\pi}{۳۶}\right) = ۱۶\cdot\cos^۲\left(\frac{۳\pi}{۳۶}\right)\cdot\cos^۲\left(\frac{۶\pi}{۳۶}\right)\cdot\cos^۲\left(\frac{۱۲\pi}{۳۶}\right)\cdot\cos^۲\left(\frac{۲۴\pi}{۳۶}\right) = ۱۶\cdot\cos^۲\left(\frac{\pi}{۱۲}\right)\cos^۲\left(\frac{\pi}{۶}\right)\cdot\cos^۲\left(\frac{\pi}{۳}\right)\cdot\cos^۲\left(\frac{۲\pi}{۳}\right)$$

$$= ۱۶\cdot\cos^۲\left(\frac{\pi}{۱۲}\right)\times\left(\frac{\sqrt{۳}}{۲}\right)^۲\times\left(\frac{۱}{۲}\right)^۲\times\left(-\frac{۱}{۲}\right)^۲ = \frac{۳}{۴}\cos^۲\left(\frac{\pi}{۱۲}\right) \quad \boxed{f\left(\frac{\pi}{۳۶}\right) = \frac{۶+۳\sqrt{۳}}{۱۶}}$$ ۷

$$\cos^۲\left(\frac{\pi}{۱۲}\right) = \frac{۱+\cos\frac{\pi}{۶}}{۲} = \frac{۱+\frac{\sqrt{۳}}{۲}}{۲} = \frac{۲+\sqrt{۳}}{۴}$$

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$$\frac{۱-\sin x}{۱+\sin x} = ۴ \rightarrow ۴+۴\sin x = ۱-\sin x \rightarrow \sin x = -\frac{۳}{۵} \xrightarrow{\text{ربع سوم}} \cos x = -\sqrt{۱-\underbrace{\sin^۲ x}_{\frac{۹}{۲۵}}} = -\frac{۴}{۵}$$

$$\tan x = \frac{\sin x}{\cos x} = \frac{-\frac{۳}{۵}}{-\frac{۴}{۵}} = \frac{۳}{۴} \xrightarrow{\tan ۲\alpha = \frac{۲\tan\alpha}{۱-\tan^۲\alpha}} \tan x = \frac{۲\tan\frac{x}{۲}}{۱-\tan^۲\frac{x}{۲}} = \frac{۳}{۴}$$

$$\rightarrow ۳\tan^۲\frac{x}{۲} + ۸\tan x - ۳ = ۰ \rightarrow \left(\tan\frac{x}{۲}+۳\right)\left(۳\tan\frac{x}{۲}-۱\right) = ۰ \rightarrow \tan\frac{x}{۲} = \frac{۱}{۳}, \quad \boxed{\tan\frac{x}{۲} = -۳}$$ ۸

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$$\frac{\sin\theta}{\underbrace{۱-\cos\theta}_{۲\sin^۲\frac{\theta}{۲}}} + \frac{\overbrace{۱+\cos\theta}^{۲\cos^۲\frac{\theta}{۲}}}{\sin\theta} = \frac{۲\sin\frac{\theta}{۲}\cos\frac{\theta}{۲}}{۲\sin^۲\frac{\theta}{۲}} + \frac{۲\cos^۲\frac{\theta}{۲}}{۲\sin\frac{\theta}{۲}\cdot\cos\frac{\theta}{۲}} = \cot\frac{\theta}{۲} + \cot\frac{\theta}{۲} = ۲\cot\frac{\theta}{۲}$$ ۹

$$\sin\theta = ۲\sin\frac{\theta}{۲}\cos\frac{\theta}{۲}$$

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$$\Rightarrow ۲\cot\frac{\theta}{۲} = k\cot\frac{\theta}{۲} \rightarrow \boxed{k = ۲}$$

$$\sin\alpha = \frac{\sqrt{۲}}{۱۰} \xrightarrow[\text{دوم}]{\alpha\ \text{در ربع}} \cos\alpha < ۰ \rightarrow \cos\alpha = -\sqrt{۱-\underbrace{\sin^۲\alpha}_{\frac{۲}{۱۰۰}}} = -\frac{۷\sqrt{۲}}{۱۰}$$

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$$\cos\left(\frac{۱۱\pi}{۴}+\alpha\right) = \cos\left(\frac{۳\pi}{۴}+\alpha\right) = \cos\frac{۳\pi}{۴}\cdot\cos\alpha - \sin\frac{۳\pi}{۴}\cdot\sin\alpha = -\frac{\sqrt{۲}}{۲}\times\frac{-۷\sqrt{۲}}{۱۰} - \frac{\sqrt{۲}}{۲}\times\frac{\sqrt{۲}}{۱۰}$$ ۱۰

$$= \frac{۷}{۱۰} - \frac{۱}{۱۰} = \boxed{۰٫۶}$$