نام و نام خانوادگی ......ملیکا کبیری...... پاسخنامه تشریحی تکلیف شماره ..۲۸.... کلاس ..یازدهم تجربی..........

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$$\cot\alpha = \frac{\cos\alpha}{\sqrt{1-\cos^2\alpha}} = \frac{\cos\alpha}{\sqrt{\sin^2\alpha}} = \frac{\cos\alpha}{|\sin\alpha|} \quad ① \qquad \cot\alpha = \frac{\cos\alpha}{\sin\alpha} \quad ②$$

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

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

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

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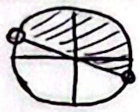
$$\frac{-\pi}{12} < x < \frac{5\pi}{12} \to \frac{-\pi}{6} < 2x < \frac{5\pi}{6}$$



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

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

۳

$$\tan x + \cot x = -3 \to \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = -3 \to \frac{\cancel{\sin^2 x + \cos^2 x}^{\,1}}{\sin x \cos x} = -3 \to \sin x \cdot \cos x = \frac{-1}{3}$$

$$3\pi < 4x < 4\pi \to \frac{3\pi}{4} < x < \pi \to \left.\begin{matrix} \sin x > 0 \\ \cos x < 0 \\ |\cos x| > |\sin x| \end{matrix}\right\} \to \sin x + \cos x < 0 \quad ①$$

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

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

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

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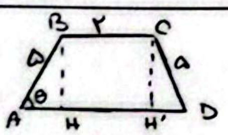

$$\cos\theta = 0/6 = \frac{AH}{\underset{5}{AB}} = \frac{DH'}{\underset{5}{CD}} \to AH = DH' = 3 \quad AD = 3+3+2 = 8$$

$$BC = HH' = 2$$

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

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

۵

$$\tan(\underset{270+15}{285°})\tan(\underset{-180+15}{-165°}) - \sin(\underset{3\times360+15}{1095°})\cos(\underset{270-15}{255°}) = K\cos^2 15$$

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

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

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

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

$f(x) = ۱۶\cos^۲(۲x)\cos^۲(۴x)\cos^۲(۸x)\cos^۲(۱۶x)$

$f(\frac{\pi}{۲۴}) = ۱۶\cdot\cos^۲(\frac{۲\pi}{۲۴})\cdot\cos^۲(\frac{۴\pi}{۲۴})\cdot\cos^۲(\frac{۸\pi}{۲۴})\cdot\cos^۲(\frac{۱۶\pi}{۲۴}) = ۱۶\cdot\cos^۲(\frac{\pi}{۱۲})\cdot\cos^۲(\frac{\pi}{۶})\cdot\cos^۲(\frac{\pi}{۳})\cdot\cos^۲(\frac{۲\pi}{۳})$

$= ۱۶\cdot\cos^۲(\frac{\pi}{۱۲}) \times (\frac{\sqrt{۳}}{۲})^۲ \times (\frac{۱}{۲})^۲ \times (-\frac{۱}{۲})^۲ = \frac{۳}{۴}\cos^۲(\frac{\pi}{۱۲})$ $\boxed{f(\frac{\pi}{۲۴}) = \frac{۶+۳\sqrt{۳}}{۱۶}}$ ۷

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

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

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

$\rightarrow ۳\tan^۲\frac{x}{۲} + ۸\tan x - ۳ = ۰ \rightarrow (\tan\frac{x}{۲}+۳)(۳\tan\frac{x}{۲}-۱) = ۰ \rightarrow \tan\frac{x}{۲} = \frac{۱}{۳}$ ۸

$\boxed{\tan\frac{x}{۲} = -۳}$

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

$= ۲\cot\frac{\theta}{۲}$

$\sin\theta = ۲\sin\frac{\theta}{۲}\cos\frac{\theta}{۲}$ ۹

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

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

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

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