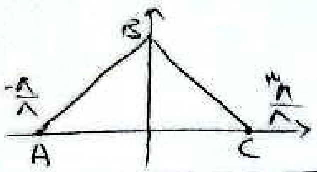
نام و نام خانوادگی ..متین... محمد راد... پاسخنامه تشریحی تکلیف شماره ۱۵... کلاس .دهم ریاضی A........

۲۰

$y = \tan(-2x+\frac{\pi}{4}) \to x=0 \to \tan(\frac{\pi}{4}) = 1 \to B=(0,1)$

$\tan(-2x+\frac{\pi}{4}) = \tan(\frac{\pi}{2})$ یا $\tan(-2x+\frac{\pi}{4}) = \tan(-\frac{\pi}{2})$ ۱

$\Downarrow \quad x = -\frac{\pi}{8}\ A \qquad \Downarrow \quad x = \frac{3\pi}{8}\ C$



$\frac{1\times(\frac{3\pi}{8}-(-\frac{\pi}{8}))}{2} = \frac{\pi}{4}$ ۲ ✓ یا $C-A = T = \frac{\pi}{|-2|} = \frac{\pi}{2}$

$x=\frac{2}{3} \to \frac{4}{9} - \frac{2}{3}\sin\alpha - \frac{1}{4}(1-\sin^2\alpha) = 0 \xrightarrow{\times 36} 16-24\sin\alpha - 9(1-\sin^2\alpha) = 9\sin^2\alpha - 24\sin\alpha + 7 = 0$

$\sin\alpha = \frac{24 \pm \sqrt{576-252}}{18} \to \frac{42}{18}$ × ۲

$\to \frac{1}{3}$ ✓ $\Rightarrow \cos^2\alpha = 1-\frac{1}{9} \Rightarrow \cos\alpha = \frac{\sqrt{8}}{3} = \frac{2\sqrt{2}}{3}$

$1+\tan^2 = \frac{1}{\cos^2\alpha} = \frac{1}{\cos^2} = \frac{1}{\frac{8}{9}} = \frac{9}{8}$ ۲ ✓

$\log(\sin\alpha) - \log(-\cos\alpha) = \log 3 \xrightarrow[\cos\alpha<0]{\sin\alpha>0} \log\frac{\sin\alpha}{-\cos\alpha} = \log 3 \to \sin\alpha = -3\cos\alpha$

$\sin^2\alpha+\cos^2\alpha = 1 \xrightarrow{\sin\alpha = -3\cos\alpha} \cos\alpha = -\frac{\sqrt{10}}{10},\ \sin\alpha = \frac{3\sqrt{10}}{10}$ ۳

$\sin\alpha - \cos\alpha = \frac{3\sqrt{10}}{10} + \frac{\sqrt{10}}{10} = \frac{4\sqrt{10}}{10}$ ۲ ✓

$\sin^4\theta + 1 - \sin^2\theta = \frac{4}{5} \to \sin^2\theta\,\underbrace{(\cancel{\sin^2\theta-1})}_{\cos^2\theta} = -\frac{1}{5}$

$\cos^4 + \sin^2\theta = \cos^4\theta + 1 - \cos^2\theta = \cos^2\theta\,\underbrace{(\cancel{\cos^2\theta-1})}_{\sin^2\theta} + 1 = -\frac{1}{5}+1 = \frac{4}{5}$ ۴

۲ ✓

$\frac{3\sin x + \sin x\cos x}{2-2\cos^2\alpha} < 0 \qquad \frac{1}{\cos x}\underbrace{(\cancel{\sin^2 x-1})}_{-\cos^2 x} > 0 \to -\cos x > 0 \to \cos x < 0$

$\frac{\sin x(3+\cos x)}{2(\cancel{1-\cos^2\alpha})_{\sin^2 x}} \to \frac{3+\cos x}{2\sin x} < 0 \Rightarrow \sin x < 0$ ناحیه سوم ۵

۲ ✓

$$\frac{2\cos x + 3\sin x}{\sin x \cos x} = 0 \longrightarrow 2\cos x + 3\sin x = 0 \longrightarrow \cos x = -\frac{3}{2}\sin x$$

$$\sin^2 x + \cos^2 x = 1 \xrightarrow{\cos x = -\frac{3}{2}\sin x} \sin x = \pm\frac{2\sqrt{13}}{13}, \quad \cos x = \mp\frac{3\sqrt{13}}{13} \quad \sin x \cos x < 0$$

$$\tan x + \cot x = \frac{1}{\frac{\sin^2 x + \cos^2 x}{\sin x \cos x}} = \frac{1}{-\frac{2\sqrt{13}}{13} \times \frac{3\sqrt{13}}{13}} = -\frac{13}{6}$$

۲ ✓ ۶

$$1 + 2\sin 25\cos 25 = 1 + \sin 50 = (\sin 25 + \cos 25)^2 \Rightarrow \sqrt{1+\sin 50} = \sin 25 + \cos 25$$

$$\sin\alpha + \cos\alpha = \sqrt{2}\sin\left(\alpha + \frac{\pi}{4}\right) \longrightarrow \sqrt{2}\sin 70 = \sqrt{2}\cos 20$$ ۷

$$\sin 50 + \sin 10 = \sin(30+20) + \sin(30-20) = 2\,\cancel{\sin 30}\cos 20 = \cos 20$$

$$\frac{\sqrt{1+\sin 50}}{\sin 50 + \sin 10} = \frac{\sqrt{2}\cos 20}{\cos 20} = \sqrt{2}$$

۲ ✓

$$\sin^2\alpha = \frac{1-\cos 2\alpha}{2} \longrightarrow 1 - 2\sin^2 5 = \cos 10, \quad \cos 2\alpha = 2\cos^2\alpha - 1 \Rightarrow$$

$$2\cos^2 10 - 1 = \cos 20$$

$$\cos 2\alpha = \frac{1-\tan^2\alpha}{1+\tan^2\alpha} \Rightarrow \frac{1-\tan^2 5}{1+\tan^2 5} = \cos 10 \Rightarrow \frac{\sin 10}{\cos 10} \times \cos 10 \times \cos 20 \times \cos 40 = \frac{1}{8}\,\frac{\sin 80}{\sin 10}$$ ۸

$$\frac{1}{2}\sin 20 \quad \frac{1}{4}\sin 40 \quad \frac{1}{8}\sin 80$$

$$\frac{1}{8}\,\frac{\sin\left(\frac{\pi}{2} - 10\right)}{\sin 10} \Rightarrow \frac{1}{8}\,\frac{\cos 10}{\sin 10} = \frac{1}{8}\cot 10$$

۲ ✓

$$5\cos 2\alpha - 12\cos\alpha = 10\cos^2\alpha - 12\cos\alpha - 5 = ?$$

$$(2 - 3\sin\alpha)^2 + \cos^2\alpha - 9\cos^2\alpha + 4 - 12\cos\alpha + \cos^2\alpha = 10\cos^2\alpha - 12\cos\alpha + 4 = 1$$ ۹

$$10\cos^2\alpha - 12\cos\alpha = -3$$

$$10\cos^2\alpha - 12\cos\alpha - 5 = -3 - 5 = \boxed{-8}$$

۲ ✓

$$\cos A = \cos(\pi - (B+C)) = -\cos(B+C) \Rightarrow 1 - \cos(B+C) = 2\sin B\sin C$$

$$1 - (\cos B\cos C - \sin B\sin C) = 2\sin B\sin C \Rightarrow 1 - \cos B\cos C + \sin B\sin C = 2\sin B\sin C$$ ۱۰

$$1 - \cos B\cos C + \sin B\sin C = 0 \longrightarrow 1 - \cos(B-C) = 0 \longrightarrow \cos(B-C) = 1 \longrightarrow B - C = 0 \Rightarrow B = C = 72$$

۲ ✓ $$\hat{A} = 180 - \underbrace{B + C}_{144} = \boxed{36}$$