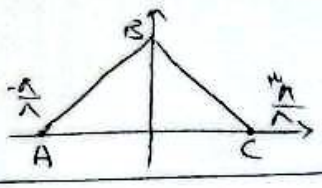
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ۱۵... کلاس .....

۱

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

$\to \tan(-2x + \frac{\pi}{4}) = \tan(\frac{\pi}{2}) \quad , \quad \tan(-2x + \frac{\pi}{4}) = \tan(-\frac{\pi}{2})$

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



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

۲

$x = \frac{\pi}{3} \to \frac{\pi}{9} - \frac{2}{3}\sin\alpha - \frac{1}{4}(1 - \sin^2\alpha) = 0 \xrightarrow{\times 36} 4 - 24\sin\alpha - 9(1 - \sin^2\alpha) = 9\sin^2\alpha - 24\sin\alpha - 5 = 0$

$\sin\alpha = \frac{24 \pm \sqrt{576 - 2025}}{18} \to \frac{4}{5}\alpha$

$\to \frac{1}{5}V \Rightarrow \cos\alpha = 1 - \frac{1}{9} \Rightarrow \cos\alpha = \frac{\sqrt{8}}{3} = \frac{2\sqrt{2}}{3}$

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

۳

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

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

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

۴

$\sin^4\theta + 1 - \sin^2\theta = \frac{4}{25} \to \sin^2\theta \underbrace{(\sin^2\theta - 1)}_{\cos^2\theta} = -\frac{1}{25}$

$\cos^4\theta + \sin^2\theta = \cos^2\theta + 1 - \cos^2\theta = \cos^2\theta \underbrace{(\cos^2\theta - 1)}_{\sin^2\theta} + 1 = -\frac{1}{25} + 1 = \frac{24}{25}$

۵

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

$\frac{\sin m(3 + \cos m)}{2\underbrace{(1 - \cos^2\alpha)}_{\sin^2 m}} \to \frac{3 + \cos m}{2\sin m} < 0 \Rightarrow \sin m < 0$

ناصبی

$\frac{2\cos\alpha + 3\sin\alpha}{\sin\alpha - \cos\alpha} = 5 \longrightarrow 2\cos\alpha + 3\sin\alpha = 5\sin\alpha - 5\cos\alpha \longrightarrow \cos\alpha = -\frac{3}{8}\sin\alpha$

$\sin^2\alpha + \cos^2\alpha = 1 \xrightarrow{\cos\alpha = -\frac{3}{8}\sin\alpha} \sin\alpha = \pm\frac{8\sqrt{55}}{64}$ $\Rightarrow \sin\alpha\cos\alpha = \frac{9}{32}$

$\cos\alpha = \pm\frac{3\sqrt{55}}{64}$

$\tan\alpha\cot\alpha = \frac{\sin^2\alpha + \cos^2\alpha}{\sin\alpha\cos\alpha} = \frac{1}{\frac{8\sqrt{55}}{64} \times \frac{3\sqrt{55}}{64}} = \frac{64}{9}$

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

$\sin\alpha + \cos\alpha = \sqrt{2}\sin\left(\alpha + \frac{\pi}{4}\right) \longrightarrow \sqrt{2}\sin 75^\circ = \sqrt{2}\cos 15^\circ$

$\sin\theta\cos 15^\circ = \sin(45^\circ + 30^\circ) + \sin(45^\circ - 30^\circ) = 2\sin 45^\circ\cos 30^\circ = \cos 15^\circ$

$\frac{\sqrt{1+\sin^2\theta}}{\sin\theta + \sin 15^\circ} = \frac{\sqrt{2}\cos 15^\circ}{\cos 15^\circ} = \sqrt{2}$

$\sin^2\alpha = \frac{1-\cos 2\alpha}{2} \longrightarrow 1 - 2\sin^2\theta = \cos 15^\circ$, $\cos 2\alpha = 2\cos^2\alpha - 1 \Rightarrow$

$2\cos^2 15^\circ - 1 = \cos 15^\circ$

$\cos 2\alpha = \frac{1-\tan^2\alpha}{1+\tan^2\alpha} = \frac{1-\tan^2 15^\circ}{1+\tan^2 15^\circ} = 1 \Rightarrow \frac{\sin 15^\circ}{\cos 15^\circ} \times \cos 15^\circ \times \cos 30^\circ \times \cos 60^\circ = \frac{1}{8}\frac{\sin 45^\circ}{\sin 15^\circ}$

$\frac{1}{8}\frac{\sin\left(\frac{\pi}{2} - 15^\circ\right)}{\sin 15^\circ} = \frac{1}{8}\frac{\cos 15^\circ}{\sin 15^\circ} = \frac{1}{8}\cot 15^\circ$

$8\cos 2\alpha - 12\cos\alpha = 16\cos^2\alpha - 12\cos\alpha - 8 = ?$

$(2\cdot 3\sin\alpha)^2 + \cos^2\alpha = 9\cos^2\alpha + 4 - 12\cos\alpha + \cos^2\alpha = 16\cos^2\alpha - 12\cos\alpha + 4 = 1$

$16\cos^2\alpha - 12\cos\alpha = -3$

$16\cos^2\alpha - 12\cos\alpha - 8 = -11 \boxed{-8}$

$\cos A + \cos(180^\circ - (B+C)) = -\cos(B+C) \Rightarrow 1 - \cos(B+C) = 2\sin B\sin C$

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

$1 - \cos B\cos C + \sin B\sin C = 0 \longrightarrow 1 - \cos B\cos C = 0 \longrightarrow \cos(B-C) = 0 \longrightarrow B - C = 90^\circ \Rightarrow B = C = 45^\circ$

$\hat{A} = 180^\circ - 135^\circ = \boxed{45^\circ}$