۲۰ آفرین

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

۱

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

$AC = T \to T = \frac{\pi}{|-2|} = \frac{\pi}{2}$

$\frac{AC\times B}{2} = \frac{\pi}{2}\times\frac{1}{2}\times 1 = \boxed{\frac{\pi}{4}}$

۲

۲

$\frac{4}{9} - \frac{2}{3}\sin\alpha - \frac{1}{4}\cos^2\alpha = 0 \xrightarrow{\cos^2\alpha = 1-\sin^2\alpha} \frac{1}{4}\sin^2 - \frac{2}{3}\sin + \frac{7}{36} = 0 \xrightarrow{\times 36} 9\sin^2 - 24\sin + 7 = 0$

$\sin = \frac{1}{3}$ یا $\frac{7}{3}$ غ‌ق $\to \sin^2\alpha + \cos^2\alpha = 1 \to \cos^2\alpha = \frac{8}{9}$

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

۲

۳

$\log\frac{\sin\alpha}{-\cos\alpha} = \log 3 \to -3\cos\alpha = \sin\alpha \to 9\cos^2\alpha + \cos^2\alpha = 1 \to |\cos\alpha| = \frac{1}{\sqrt{10}}$

$\log x \to x > 0 \Rightarrow \sin\alpha > 0$, $-\cos\alpha > 0 \Rightarrow \cos\alpha < 0$

$\sin\alpha = \frac{3}{\sqrt{10}}$ و $\cos\alpha = -\frac{1}{\sqrt{10}}$

$\sin\alpha - \cos\alpha = \boxed{\frac{4}{\sqrt{10}} = \frac{2\sqrt{10}}{5}}$

۲

۴

$\sin^4\theta + 1 - \sin^2\theta = \frac{4}{5} \xrightarrow{\sin^2\theta = t} t^2 - t + \frac{1}{5} = 0 \to \sin^2 = \frac{5\pm\sqrt{5}}{10}$

$\sin^2 = \frac{5+\sqrt{5}}{10}$ و $\cos^2 = \frac{5-\sqrt{5}}{10}$

$\left(\frac{5-\sqrt{5}}{10}\right)^2 + \frac{5+\sqrt{5}}{10} = \boxed{\frac{4}{5}}$

۲

۵

$\frac{\sin x(3+\cos x)}{2(1-\cos^2 x)} = \frac{3+\cos x}{2\sin x} < 0 \Rightarrow \sin x < 0$

$\frac{\sin^2 x - 1}{\cos x} > 0 \to -\cos x > 0 \to \cos x < 0$

ناحیه سوم

۲

$\frac{2}{\sin x} = -\frac{3}{\cos x} \Rightarrow -3\sin x = 2\cos x \rightarrow \frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = -\frac{2}{3} - \frac{3}{2} = \boxed{\frac{-13}{6}}$ ۶

۲

$\sin 50 + 1 = (\sin 25 + \cos 25)^2 \rightarrow \frac{\sin 25 + \cos 25}{\sin 10 + \sin 50}$

$2\sin\left(\frac{50+10}{2}\right)\cos\left(\frac{50-10}{2}\right) = 2\sin 30 \cdot \cos 20^\circ = \cos 20$

$\frac{\sin 25 + \cos 25}{\cos 20}$

$\sin 25 + \cos 25 = \frac{\sqrt{2}\sin(25+45)\cos 20}{\cos 20} = \boxed{\sqrt{2}}$ ۷

۲

$1 = \sin^2 x + \cos^2 x \rightarrow \sin^2 5^\circ + \cos^2 5^\circ - 2\sin^2 5^\circ = \cos^2 5 - \sin^2 5 = \cos 10^\circ$

$2\cos^2 10^\circ - \sin^2 10 - \cos^2 10 = \cos^2 10 - \sin^2 10 = \cos 20^\circ$

$1 - \tan^2 20^\circ = \frac{\cos^2 20 - \sin^2 20^\circ}{\cos^2 20} = \frac{\cos 40}{\cos^2 20}$

$1 + \tan^2 20^\circ = \frac{1}{\cos^2 20}$

$\frac{\frac{\cos 40^\circ}{\cos^2 20}}{\frac{1}{\cos^2 20}} = \cos 40^\circ$ ۸

$\frac{\cos 10^\circ \times \cos 20^\circ \times \cos 40^\circ \times \sin 10^\circ}{\sin 10^\circ} = \frac{1}{8} \times \frac{\sin 80^\circ}{\sin 10^\circ} = \boxed{\frac{\cot 10^\circ}{8}}$

۲

$\sin\alpha = 2 - 3\cos\alpha \xrightarrow{x^2} \underbrace{\sin^2\alpha}_{1-\cos^2\alpha} = 4 + 9\cos^2\alpha - 12\cos\alpha \rightarrow 10\cos^2\alpha - 12\cos\alpha + 3 = 0$

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

$\cos 2\alpha = 2\cos^2\alpha - 1$

$\hookrightarrow 5\cos 2\alpha - 12\cos\alpha = \underbrace{10\cos^2\alpha - 12\cos\alpha}_{-3} - 5 = \boxed{-8}$ ۹

۲

$2\sin x \sin y = \cos(x-y) - \cos(x+y)$ $\qquad \cos^2\frac{A}{2} = \frac{1+\cos A}{2}$

$\hookrightarrow \sin B \sin C = \frac{1}{2}\left(\cos(B-C) - \cos(B+C)\right)$

$1 + \cos A = \cos(B-C) - \underbrace{\cos(B+C)}_{+\cos A} \rightarrow B + C = 180 - A$ ۱۰

$\hookrightarrow 1 = \cos(B-C) \rightarrow \cos 0 = 1 \rightarrow B = C = 72^\circ \rightarrow 72 \times 2 = 144$

$\underset{144}{B+C} = 180 - A \rightarrow \boxed{A = 36^\circ}$

۲