نام و نام خانوادگی ...یوسف عربیان... پاسخنامه تشریحی تکلیف شماره .... کلاس ....

۲۰

۱

$x_B = 0 \Rightarrow \tan(-2(x_B)+\frac{\pi}{4}) = 1 \Rightarrow B\,|\,{}^{0}_{1}$

$\tan(-2(x_A)+\frac{\pi}{4}) = -\infty \Rightarrow x_A = \frac{3\pi}{8} \Rightarrow A\,|\,{}^{\frac{3\pi}{8}}_{0}$

$\tan(-2(x_C)+\frac{\pi}{4}) = +\infty \Rightarrow x_C = -\frac{\pi}{8} \Rightarrow C\,|\,{}^{-\frac{\pi}{8}}_{0}$

$\Rightarrow S = 1 \times (\frac{3\pi}{8}+\frac{\pi}{8}) \times \frac{1}{2} = \frac{\pi}{4}$

(۲) ✓

۲

$x = \frac{2}{3} \Rightarrow \frac{4}{9} - \frac{2}{3}\sin\alpha - \frac{1}{4}(1-\sin^2\alpha) = 0 \Rightarrow \sin\alpha =$ ۷ غ ق ق ، $\frac{1}{3}$

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

(۲) ✓

۳

$\log \sin\alpha - \log(-\cos\alpha) = \log(-\tan\alpha) = \log 3$

$\Rightarrow \tan\alpha = -3 \quad \sin\alpha > 0 \quad -\cos\alpha > 0 \Rightarrow \sin\alpha = \frac{1}{\sqrt{10}}$

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

$\sin\alpha - \cos\alpha = \frac{1}{\sqrt{10}} + \frac{3}{\sqrt{10}} = \frac{4}{\sqrt{10}}$

(۲) ✓

۴

$\sin^4\alpha - \sin^2\alpha + 1 = \frac{4}{5}$

$\cos^4\alpha + \sin^2\alpha = (1-\sin^2\alpha)(1-\sin^2\alpha) - \sin^2\alpha$

$= \sin^4\alpha - \sin^2\alpha + 1$

$\Rightarrow \cos^4\alpha + \sin^2\alpha = \frac{4}{5}$

(۲) ✓

۵

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

همواره مثبت

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

$\Rightarrow$ ربع سوم

(۲) ✓

$\frac{2}{\sin\alpha} + \frac{3}{\cos\alpha} = 0 \Rightarrow \frac{2}{\sin\alpha} = -\frac{3}{\cos\alpha} \Rightarrow -\frac{2}{3} = \tan\alpha$

$\Rightarrow \cot\alpha = -\frac{3}{2}$

$\tan\alpha + \cot\alpha = -\frac{2}{3} - \frac{3}{2} = \frac{-13}{6}$

(ب) ✓

۶

$$\frac{\sqrt{1+\cos 40}}{\sin(20+30)+\sin(30-20)} = \frac{\sqrt{2\cos^2 20}}{2\sin 30\cos 20} = \sqrt{2}$$

(ج) ✓

۷

$\frac{1-\tan^2 20}{1+\tan^2 20} = \cos 40$ $\quad 2\cos^2 10 - 1 = \cos 20$ $\quad 1-2\sin^2\alpha = \cos 10$

$\cos 10 \times \cos 20 \times \cos 40 = \frac{\sin 10}{\sin 10} \times \cos 10 \times \cos 20 \times \cos 40 = \frac{1}{8}\frac{\sin 80}{\sin 10}$

$= \frac{1}{8}\frac{\cos 10}{\sin 10} = \frac{1}{8}\cot 10$ (ج) ✓

۸

$\sin\alpha + 2\cos\alpha = 2$

$\sqrt{1-\cos^2\alpha} + 2\cos\alpha = 2$

$\sqrt{1-\cos^2\alpha} = 2 - 2\cos\alpha$

$1-\cos^2\alpha = 4\cos^2\alpha - 8\cos\alpha + 4$

$5\cos^2\alpha - 8\cos\alpha + 3 = 0$ (ج) ✓

$5\cos 2\alpha - 12\cos\alpha$

$= 5(2\cos^2\alpha - 1) - 12\cos\alpha$

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

$= \underbrace{10\cos^2\alpha - 12\cos\alpha + 3}_{0} - 8$

$= -8$

۹

$\sin B \times \sin C = \frac{1+\cos A}{2}$

$2\sin B \times \sin C = 1 - \cos(B+C)$ (ج) ✓

$2\sin B \times \sin C = 1 - \cos B\cos C + \sin B \times \sin C$

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

$\Rightarrow B = C = 72 \Rightarrow A = 36^\circ$

۱۰