دوازدهم دختر A

روشنا انوسی

subject : شماره تکلیف: ۱۵   ۱_۱   Year :   Month :   Date :

①

B: $x=0 \Rightarrow \tan\frac{\pi}{4} = 1 \Rightarrow (0,1)$

A: $-2x + \frac{\pi}{4} = \frac{\pi}{2} \Rightarrow x = -\frac{\pi}{8}$

C: $-2x + \frac{\pi}{4} = -\frac{\pi}{2} \Rightarrow x = +\frac{3\pi}{8}$

$\Rightarrow C - A = \frac{\pi}{2}$

$\Rightarrow S = \frac{1}{2} \times 1 \times \frac{\pi}{2}$

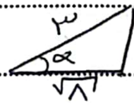
$\Rightarrow S = \frac{\pi}{4}$

②

جایگذاری ریشه $\rightarrow \frac{4}{9} - \frac{2}{3}(\sin\alpha) - \frac{1}{4}\cos^2\alpha = 0$

$\Rightarrow 16 - 24\sin\alpha - 9(1 - \sin^2\alpha) = 0 \Rightarrow 9\sin^2\alpha - 24\sin\alpha + 7 = 0$

روش روسی $\Rightarrow P = 63 \quad S = +24 \Rightarrow \sin\alpha = \frac{21}{9}$ غ ق ق ، $\sin\alpha = \frac{3}{9} = \frac{1}{3}$ ✓

$\Rightarrow$ 

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

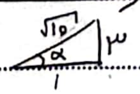
③

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

$\Rightarrow \log\frac{\sin\alpha}{-\cos\alpha} = \log 3 \Rightarrow \sin\alpha = -3\cos\alpha \xrightarrow{\text{توان ۲}} \sin^2\alpha = 9\cos^2\alpha$

زیرا $(-\cos\alpha)$ باید مثبت شود.

$\sin^2\alpha = 1 - \cos^2\alpha \rightarrow 10\cos^2\alpha = 1 \Rightarrow \cos\alpha = +\frac{1}{\sqrt{10}} \Rightarrow$ غ ق ق ، $\cos\alpha = -\frac{1}{\sqrt{10}}$ ✓

$\Rightarrow$ 

$\Rightarrow \sin\alpha = \frac{3}{\sqrt{10}} \Rightarrow \sin\alpha - \cos\alpha = \frac{4}{\sqrt{10}} = \frac{4\sqrt{10}}{10} = \frac{2\sqrt{10}}{5}$

④

$\sin^4\theta + \cos^2\theta = \frac{4}{5} \xrightarrow{\cos^2\theta = 1 - \sin^2\theta} \sin^4\theta - \sin^2\theta + 1 = \frac{4}{5}$

$\Rightarrow \sin^2\theta(\sin^2\theta - 1) + 1 = \frac{4}{5} \Rightarrow \sin^2\theta(-\cos^2\theta) + 1 = \frac{4}{5}$

$\Rightarrow -\sin^2\theta\cos^2\theta + 1 = \frac{4}{5}$

روشا ایوبی

Viana subject : Year : Month : Date :

۴)

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

$=\cos^2\theta(-\sin^2\theta)+1=-\sin^2\theta\cos^2\theta+1=\frac{4}{5}$

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

۵)

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

($3+\cos x$ همواره $+$ ؛ $2\sin^2 x$ همواره $+$ ؛ منفی است $-$)

$|\sin x|\left(\frac{\sin x}{\cos x}\right)-\frac{1}{\cos x}=\frac{\sin^2 x-1}{\cos x}=\frac{-\cos^2 x}{\cos x}>0$

(صورت همواره $-$) $\Rightarrow \cos x<0$

$\Rightarrow \sin x<0$ و $\cos x<0 \Rightarrow$ در ناحیه سوم می‌باشد

۶)

$\frac{2}{\sin x}+\frac{3}{\cos x}=0\Rightarrow\frac{2\cos x+3\sin x}{\frac{1}{2}\sin 2x}=0\Rightarrow 2\cos x+3\sin x=0$

$\Rightarrow\cos x=-\frac{3}{2}\sin x\Rightarrow\cos^2 x=\frac{9}{4}\sin^2 x\Rightarrow 1-\sin^2 x=\frac{9}{4}\sin^2 x$

$\Rightarrow\sin^2 x=\frac{4}{13}$ و $\cos^2 x=\frac{9}{13}\Rightarrow\sin x=\pm\frac{2}{\sqrt{13}}$ و $\cos x=\pm\frac{3}{\sqrt{13}}$

$\cos x$ و $\sin x$ مختلف العلامتند $\Rightarrow \tan x+\cot x=\frac{1}{\sin x\cos x}=\frac{1}{-\frac{6}{13}}=\boxed{-\frac{13}{6}}$

دوستا ایوس

Viana subject : Year : Month : Date :

$\sqrt{1+\sin 80^\circ} = \sqrt{1+\cos 10^\circ} \xrightarrow{\text{فرمول طلایی}} = \sqrt{2\cos^2 5^\circ} = \sqrt{2}\cos 5^\circ$ (۷)

$\sin 80^\circ + \sin 10^\circ = \sin(30^\circ+50^\circ) + \sin(30^\circ-50^\circ)$

$= \sin 30^\circ \cos 50^\circ + \sin 50^\circ \cos 30^\circ + \sin 30^\circ \cos 50^\circ - \sin 50^\circ \cos 30^\circ$

$= 2\sin 30^\circ \cos 50^\circ = \cos 50^\circ$

$\Rightarrow \frac{\sqrt{1+\sin 80^\circ}}{\sin 80^\circ + \sin 10^\circ} = \frac{\sqrt{2}\cos 5^\circ}{\cos 5^\circ} = \boxed{\sqrt{2}}$

$1-2\sin^2 \alpha \xrightarrow{\text{فرمول طلایی}} = \cos 10^\circ$ (۸)

$2\cos^2 10^\circ - 1 = \cos 20^\circ \qquad \frac{1-\tan^2 20^\circ}{1+\tan^2 20^\circ} \xrightarrow{\cos 2\alpha = \frac{1-\tan^2\alpha}{1+\tan^2\alpha}} \cos 40^\circ$

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

$= \boxed{\frac{1}{8}\cot 10^\circ}$

$5\cos 2\alpha - 12\cos\alpha = 5(2\cos^2\alpha - 1) - 12\cos\alpha = 10\cos^2\alpha - 12\cos\alpha - 5$ (۹)

$\sin\alpha + 3\cos\alpha = 2 \Rightarrow \sin\alpha = 2 - 3\cos\alpha \xrightarrow{\text{توان ۲}} \sin^2\alpha = 9\cos^2\alpha - 12\cos\alpha + 4$

$\sin^2\alpha = 1-\cos^2\alpha \Rightarrow 10\cos^2\alpha - 12\cos\alpha + 3 = 0 \Rightarrow 10\cos^2\alpha - 12\cos\alpha - 5 = -8$

$\Rightarrow \boxed{5\cos 2\alpha - 12\cos\alpha = -8}$

$\cos^2\frac{A}{2} = \frac{1+\cos A}{2} \qquad 2\sin B\sin C = 1+\cos A$ (۱۰)

$\cos(\pi-(B+C)) = -\cos(B+C)$

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

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

$\Rightarrow B = C = 72^\circ \Rightarrow A = 180^\circ - 2(72^\circ) = 36^\circ \Rightarrow \hat{A} = 36^\circ$

V