پارمیس نبی زاده ، دوازدهم دختر B ۱۹ آذرین تکلیف شماره ۱۵

۱) $x_C - x_A = T = \frac{\pi}{|-۲|} = \frac{\pi}{۲}$

$(۰, B) \rightarrow B = \tan(۰ + \frac{\pi}{۴}) = ۱$

$S_{ABC}^{\triangle} = \frac{۱}{۲} \times \frac{\pi}{۲} \times ۱ = \frac{\pi}{۴} = ۰/۷۸$

۲) $(\frac{۲}{۳}, ۰) \rightarrow \frac{۴}{۹} - \frac{۲}{۳}\sin\alpha - \frac{۱}{۴}(۱ - \sin^۲\alpha) = ۰$

$(\frac{۱}{۴}\sin^۲\alpha - \frac{۲}{۳}\sin\alpha + \frac{۷}{۳۶} = ۰) \times ۳۶ \rightarrow ۹\sin^۲\alpha - ۲۴\sin\alpha + ۷ = ۰$

روشی $\Rightarrow \sin^۲\alpha - ۲۴\sin\alpha + ۹۳ = ۰ \quad (\sin\alpha - ۳)(\sin\alpha - ۲۱) = ۰$

$\sin\alpha = \frac{۱}{۳}, \frac{۷}{۳} \rightarrow$ قَبَل $\Rightarrow \sin\alpha = \frac{۱}{۳}, \cos\alpha = \frac{\sqrt{۸}}{۳}$

$۱ + \tan^۲\alpha = \frac{۱}{\cos^۲\alpha} = \frac{۱}{\frac{۸}{۹}} = \frac{۹}{۸}$

۳) $\log^{\sin\alpha} - \log^{-\cos\alpha} = \log^{\frac{\sin\alpha}{-\cos\alpha}} = \log^{۳}$

$\Rightarrow \tan\alpha = -۳ \qquad \log^{\sin\alpha} \rightarrow \sin\alpha > ۰ \qquad \log^{-\cos\alpha} \rightarrow \cos\alpha < ۰$

$۱ + \tan^۲ = \frac{۱}{\cos^۲\alpha} \Rightarrow \cos\alpha = \frac{-۱}{\sqrt{۱۰}} \qquad \sin\alpha = \frac{۳}{\sqrt{۱۰}}$

$\sin\alpha - \cos\alpha = \frac{۳}{\sqrt{۱۰}} - (\frac{-۱}{\sqrt{۱۰}}) = \frac{۴}{\sqrt{۱۰}} = \frac{۴\sqrt{۱۰}}{۱۰} = \frac{\sqrt{۱۰}}{۲/۵}$

۴) $\sin^۴\theta + \cos^۲\theta = \sin^۴\theta + (۱ - \sin^۲\theta) = \frac{۴}{۵}$

$\sin^۴\theta - \sin^۲\theta + \frac{۱}{۵} = ۰ \rightarrow ۵\sin^۴\theta - ۵\sin^۲\theta + ۱ = ۰$

$\sin^۲\theta = \frac{۵ \pm \sqrt{۵}}{۱۰}$ نزدیک $\rightarrow \sin^۲\theta = \frac{۵ + \sqrt{۵}}{۱۰}$

$\cos^۲\theta = ۱ - \frac{۵ + \sqrt{۵}}{۱۰} = \frac{۵ - \sqrt{۵}}{۱۰} \Rightarrow \cos^۴\theta = \frac{۳۰ - ۱۰\sqrt{۵}}{۱۰۰} = \frac{۳ - \sqrt{۵}}{۱۰}$

$\cos^۴\theta + \sin^۲\theta = \frac{۳ - \sqrt{۵}}{۱۰} + \frac{۵ + \sqrt{۵}}{۱۰} = ۰/۸$

Date:

(5) $\dfrac{\sin x\,(3+\cos x)}{2(\underbrace{1-\cos^2 x}_{\sin^2 x})} = \dfrac{(3+\overset{+}{\cos x})}{2\sin x} < 0 \Rightarrow \sin x < 0$ (2)

$\dfrac{\sin^2 x}{\cos x} - \dfrac{1}{\cos x} = \dfrac{\sin^2 x - 1}{\cos x} = \dfrac{-\cos^2 x}{\cos x} = -\cos x > 0$

$\Rightarrow \cos x < 0$

کمان در ناحیه سوم دایره مثلثاتی قرار دارد

(6) (1,175)

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

$\cos x = \dfrac{-3\sin x}{2}$ ↓ $\div \sin x$

$\sin^2 x + \cos^2 x = \sin^2 x + \dfrac{9}{4}\sin^2 x = 1 \Rightarrow \dfrac{13}{4}\sin^2 = 1$

$\sin^2 x = \dfrac{4}{13} \Rightarrow \sin x = \pm\dfrac{2}{\sqrt{13}}$ $\quad \cot x = -\dfrac{3}{2} \to \tan x = -\dfrac{2}{3}$

$\cos^2 x = \dfrac{9}{13} \Rightarrow \cos x = \pm\dfrac{3}{\sqrt{13}}$ $\quad -\dfrac{3}{2} - \dfrac{2}{3} = -\dfrac{13}{6}$

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

(7) $\sqrt{1+\sin 50} = \sqrt{1+2\sin 25\cos 25} = |\sin 25 + \cos 25|$

$\sin 50 + \sin 10 = 2\sin 30 \times \cos 20 = 2 \times \dfrac{1}{2} \times \cos 20$ (2)

$\Rightarrow \dfrac{\sin 25 + \cos 25}{\cos 20} = \dfrac{\sqrt{2}\left(\frac{1}{\sqrt{2}}\sin 25 + \frac{1}{\sqrt{2}}\cos 25\right)}{\cos 20}$

$= \dfrac{\sqrt{2}\,(\sin(25+45))}{\cos 0} = \dfrac{\sqrt{2} \times \sin 70}{\cos 20} = \sqrt{2}$ ✓

(8) (1,25)

$1 - 2\sin^2 5 = \cos^2 5 - \sin^2 5 = \cos 10$

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

$\dfrac{1-\tan^2 20}{1+\tan^2 20} = \dfrac{\cos^2 20 - \sin^2 20}{\cos^2 20 + \sin^2 20} = \cos^2 20 - \sin^2 20 = \cos 40$

$\cos 10\,[\cos 20 \times \cos 40] = \cos 10\left[\dfrac{1}{2} \times \cos 60 \times \cos 20\right]$

$= \dfrac{1}{4}\cos 10 \times \cos 20 = \dfrac{1}{4}\left[\dfrac{1}{2}\cos 30 \times \cos 10\right] = \dfrac{\sqrt{3}}{16}\cos 10$

$\sin\alpha = 2 - 2\cos\alpha$ (٩

$\sin^2\alpha + \cos^2\alpha = 4 + 9\cos^2\alpha - 12\cos\alpha + \cos^2\alpha = 1$

$\Rightarrow 12\cos\alpha = 10\cos^2\alpha + 2$ ٢

$6\cos 2\alpha - 12\cos\alpha = 6\cos^2\alpha - 6\sin^2\alpha - 12\cos\alpha$

$= 6\cos^2\alpha - 6\sin^2\alpha - 10\cos^2\alpha - 2 = -6\cos^2\alpha - 6\sin^2\alpha - 2$

$-6(\cos^2\alpha + \sin^2\alpha) - 2 = -6(1) - 2 = -8$

$B = 72$ $A + 72 + C = 180 \Rightarrow C = 180 - 72 - A$ (١٥

$(\sin 72)(\sin 108 - A) = \cos^2\frac{A}{2} = \frac{1 + \cos A}{2}$ ٢

$\Rightarrow 2(\sin 72)(\sin 108 - A) = 1 + \cos A$

$\rightarrow 2\left[\frac{1}{2}((\cos A - 36) - \cos(180 - A))\right] = 1 + \cos A$

$\Rightarrow \cos(A - 72) + \cos A = 1 + \cos A$

$\Rightarrow \cos(A - 72) = 1$ $A - 72 = 0$ $A = 72$ ✓

سوال ۸

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

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

فرمولهای

$$\frac{1-\tan^2 20^\circ}{1+\tan^2 20^\circ} = \frac{\cos^2 20^\circ - \sin^2 20^\circ}{\underbrace{\cos^2 20^\circ + \sin^2 20^\circ}_{1}} = \cos 40^\circ \quad (\cos(2\times 20^\circ) = \cos 40^\circ)$$

$$\underbrace{(\sin 10^\circ)\cos 10^\circ}_{\frac{1}{2}\sin 20^\circ} \times \cos 20^\circ \times \cos 40^\circ =$$

$$\frac{1}{2}\sin 20^\circ \times \cos 20^\circ \times \cos 40^\circ$$

$$\frac{1}{2}\times\frac{1}{2}\sin 40^\circ \times \cos 40^\circ =$$

$$\frac{1}{2}\times\frac{1}{2}\times\frac{1}{2}\sin 80^\circ = \frac{\frac{1}{8}\sin 80^\circ}{\sin 10^\circ} = \frac{1}{8}\cot 10^\circ \quad (\cot 10^\circ = \frac{\sin 80^\circ}{\sin 10^\circ})$$