

۱۹، ۱۵

کامیاب بینی داد از هم ببرد

$$y = \tan(-22 + \frac{\pi}{6}) \Rightarrow \frac{\pi}{|a|} = \text{دوره تناوب}$$

$$\Rightarrow \frac{\pi}{1-2} = \frac{\pi}{2} \Rightarrow AC = \frac{\pi}{2}$$

(۱)

$$B \rightarrow \tan(-2(0) + \frac{\pi}{6}) = \tan(\frac{\pi}{6}) = 1$$

$$\Rightarrow A \triangle B \quad \frac{1 \times \frac{\pi}{2}}{2} = \left(\frac{\pi}{6}\right) = S \text{ مثلث}$$

$$\lambda^2 - \sin \alpha \lambda - \frac{1}{6} + \frac{\sin^2 \alpha}{6} = 0$$

$$\frac{2}{3} \rightarrow \frac{6}{9} - \frac{2 \sin \alpha}{3} - \frac{1}{6} + \frac{\sin^2 \alpha}{6} = 0$$

(۲)

$$\frac{6 - 2 \sin \alpha}{9} + \frac{-1 + \sin^2 \alpha}{6} = 0$$

$$36 \times \frac{6 - 2 \sin \alpha + 9 - 9 \sin^2 \alpha}{36} = 0 \times 36$$

$$9 \sin^2 \alpha - 2 \sin \alpha + 3 = 0$$

$$\Rightarrow \sin^2 \alpha - 2 \sin \alpha + 3 = 0$$

(۳) ✓

$$\Rightarrow (\sin \alpha - 3)(\sin \alpha - 1) = 0$$

$$\sin \alpha = \frac{11}{9} \quad \sin \alpha = \frac{1}{9} = \frac{1}{9} \quad \Rightarrow \cos^2 \alpha = 1 - \sin^2 \alpha = 1 - \frac{1}{81} = \frac{80}{81} \Rightarrow \cos \alpha = \frac{\sqrt{80}}{9}$$

$$\Rightarrow 1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} = \frac{9}{80} \Rightarrow \left(\frac{9}{80}\right)$$

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

چون $\cos$ - قریب شده است
لجس حتماً بزرگ بوده است

$$\Rightarrow \log \frac{\sin \alpha}{-\cos \alpha} = \log 3 \Rightarrow \tan \alpha = \textcircled{-3} \rightarrow \text{Diagram} \quad (3)$$

$$\Rightarrow 1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow 1 + 9 = 10 \Rightarrow \cos^2 \alpha = \frac{1}{10} \Rightarrow \cos \alpha = \frac{1}{\sqrt{10}}$$

$$\Rightarrow \frac{10}{10} - \frac{1}{10} = \frac{9}{10} = \sin^2 \alpha \Rightarrow \frac{3}{\sqrt{10}} = \sin \alpha$$

$$\Rightarrow \sin \alpha - \cos \alpha = \frac{3}{\sqrt{10}} - \frac{1}{\sqrt{10}} = \textcircled{\frac{2}{\sqrt{10}}} \quad (3)$$

$$\sin^2 \alpha + \cos^2 \alpha = \frac{\epsilon}{\Delta}$$

$$\sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow (\sin^2 \alpha) + \cos^2 \alpha = \frac{\epsilon}{\Delta} \quad \sin^2 \alpha = \textcircled{2}$$

$$\Rightarrow (2) + (1-2) = \frac{\epsilon}{\Delta} \quad 2^2 - 2 + 1 = 0$$

$$\Delta 2^2 - 2 + 1 = 0 \quad 2 = \frac{\Delta \pm \sqrt{\Delta}}{10} \quad (4)$$

$$\Delta = b^2 - 4ac = 2^2 - 2 \cdot 0 = 0$$

$$\Rightarrow \sin^2 \alpha = \frac{0 \pm \sqrt{0}}{10} \Rightarrow \cos^2 \alpha = 1 - \frac{0 \pm \sqrt{0}}{10}$$

$$\Rightarrow \cos^2 \alpha + \sin^2 \alpha = \left(\frac{0 \pm \sqrt{0}}{10} \right) + \frac{0 \pm \sqrt{0}}{10}$$

$$\textcircled{2} \quad \frac{30 - 10\sqrt{0}}{100} + \frac{0 + 10\sqrt{0}}{100} = \frac{10}{100} = \textcircled{\frac{\epsilon}{\Delta}}$$

در حالت منفی و مثبت جواب را با هم که اشتباه کنی
بدست می آید.

$$\frac{\psi \sin \alpha + \sin \alpha \cos \alpha}{\cancel{\psi(1 - \cos \alpha)}} < 0 \Rightarrow \psi \sin \alpha + \sin \alpha \cos \alpha < 0$$

$$\psi \sin \alpha < -\sin \alpha \cos \alpha$$

$$\frac{\cancel{\sin \alpha} - 1}{\cos \alpha} > 0$$

$$\frac{-\cos \alpha}{-\cos \alpha} > 0$$

$$\downarrow (\cos \alpha < 0)$$

$$\cos \alpha < 0 \quad (1/a)$$

$$\psi < -\cos \alpha$$

$$(-\psi > \cos \alpha)$$

$$\sin \alpha (\psi + \cos \alpha) < 0$$

$$\frac{(\cos \alpha > 0)}{+} \Rightarrow \sin \alpha < 0$$



$$\tan \alpha + \cot \alpha = ?$$

$$\Rightarrow \frac{\sin \alpha}{\cos \alpha} + \frac{\cos \alpha}{\sin \alpha} = \frac{\sin^2 \alpha + \cos^2 \alpha}{\cos \alpha \sin \alpha} = \frac{1}{\cos \alpha \sin \alpha}$$

$$\Rightarrow \frac{\psi \cos \alpha + \psi \sin \alpha}{\sin \alpha \cos \alpha} = 0 \quad \psi \cos \alpha + \psi \sin \alpha = 0$$

$$\psi \cos \alpha = -\psi \sin \alpha$$

$$\tan \alpha + \cot \alpha = ?$$

$$\frac{-\frac{\psi}{\mu}}{\frac{\psi}{\mu}} = \frac{-\psi - \psi}{\psi} = \frac{-2\psi}{\psi} = -2$$

$$\Rightarrow \frac{\cos \alpha}{\sin \alpha} = \frac{-\psi}{\psi}$$

$$\Rightarrow \frac{\sin \alpha}{\cos \alpha} = \frac{\psi}{\psi}$$

(e) ✓

$$\frac{\sqrt{1 + r \sin^2 \theta \cos^2 \theta}}{\cos \theta_0 + \sin \theta_0} = \frac{\sqrt{\sin^2 \theta_0 + \cos^2 \theta_0 + r \sin \theta_0 \cos \theta_0}}{\cos \theta_0 + \sin \theta_0}$$

$$\frac{\sin \theta_0^2 \cos^2 \theta_0}{\cos(\theta_0 + \pi) + \sin(\theta_0 - \pi)} = \frac{\sin \theta_0 + \cos \theta_0}{\frac{1}{r} \cos \theta_0 + \frac{\sqrt{r}}{r} \sin \theta_0 + \frac{1}{r} \cos \theta_0 - \frac{\sqrt{r}}{r} \sin \theta_0} = \frac{\sin \theta_0 + \cos \theta_0}{\cos \theta_0}$$

$$\frac{r \sin(\theta_0 + \pi)}{\cos \theta_0} = \sqrt{r} \quad \text{②} \quad \checkmark$$

~~$$r \cos \theta_0 = 1 - r \sin^2 \theta_0 \cos^2 \theta_0 = r \sin^2 \theta_0$$~~

$$(1 - r \sin^2 \theta_0)(r \cos^2 \theta_0 - 1) \left(\frac{1 - \tan^2 \theta_0}{1 + \tan^2 \theta_0} \right) = (\cos \theta_0)(\cos \theta_0)(\cos \theta_0)$$

$$\frac{\frac{1}{r} \sin \theta_0 \cos \theta_0 \cos \theta_0}{\sin \theta_0} = \frac{\frac{1}{r} (\frac{1}{r} \sin^2 \theta_0)}{\sin \theta_0} = \frac{\frac{1}{r} \times \frac{1}{r} (\sin \theta_0)}{\sin \theta_0}$$

$$\Rightarrow \frac{1}{r} \frac{\cos \theta_0}{\sin \theta_0} = \frac{1}{r} \cot \theta_0 \quad \text{②} \quad \checkmark$$

$$r \cos \alpha = r - \sin \alpha \quad \Rightarrow \quad r \cos \alpha - r = -\sin \alpha$$

$$\Rightarrow (r \cos^2 \alpha - r) + \cos^2 \alpha = 1 \quad 4 \cos^2 \alpha + 1 - r \cos \alpha + \cos^2 \alpha = 1$$

$$1 \cdot \cos^2 \alpha - r \cos \alpha + r = 0 \quad \Rightarrow \quad 1 \cdot \cos^2 \alpha - r \cos \alpha = -r$$

$$\Rightarrow \alpha \cos^2 \alpha = 0(r \cos^2 \alpha - 1) = 1 \cdot \cos^2 \alpha - 0$$

$$\Rightarrow 1 \cdot \cos^2 \alpha = r \cos^2 \alpha - 0 = -r - 0 \quad \text{①} \quad \checkmark$$

با تفکر در فرمول های مثلثاتی تنها متوجه می شویم که ضلع ۲ زاویه متناظر
در هم در آنها دیده می شود $\sin(\alpha \pm \beta)$ و $\cos(\alpha \pm \beta)$ است پس
و متوجه می شویم که در اینجا باید $\cos(\alpha \pm \beta)$ باشد

$$\sin \hat{B} \sin \hat{C} = \cos B \cos C + \sin C \sin B - \cos B \cos C + \sin C \sin B$$

چون باید $\cos B \cos C$ را از طرفین حذف کنیم

$$\Rightarrow \sin \hat{B} \sin \hat{C} = \frac{1}{2} (\cos(B-C) - \cos(B+C)) = \cos^2 \frac{A}{2}$$

$$\cos^2 \frac{A}{2} = 1 + \frac{\cos A}{2} \Rightarrow \frac{1}{2} (\cos(B-C) - \cos(B+C)) = 1 + \frac{\cos A}{2}$$

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

$$\Rightarrow A+B+C = 180 \Rightarrow B+C = 180-A$$

$$\cos(B-C) - \cos(\pi - A) = \cos(B-C) + \cos A = 1 + \cos A$$

$$\cos(B-C) = 1 \quad \cos(0) = 1$$

$$B-C = 0$$

$$\cos(36^\circ) = 1$$

$$B-C = 36^\circ$$

$$\Rightarrow B=C \quad B=72^\circ \Rightarrow C=72^\circ$$

$$\Rightarrow 72^\circ + 72^\circ = 144^\circ \Rightarrow 180^\circ - 144^\circ = 36^\circ = \hat{A}$$

✓

جواب