

$$B \rightarrow u=0 \rightarrow y=\tan \frac{\pi}{2}=1$$

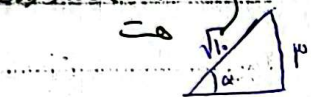
$$C \rightarrow y=-\infty \rightarrow y=\tan \frac{\pi}{2} \rightarrow -\tan \frac{\pi}{2} = -\frac{\pi}{2} \rightarrow \tan \frac{\pi}{2} = \frac{\pi}{2} \rightarrow u = \frac{\pi}{2\pi}$$

$$A \rightarrow y=+\infty \rightarrow y=\tan \frac{\pi}{2} \rightarrow -\tan \frac{\pi}{2} = \frac{\pi}{2} \rightarrow \tan \frac{\pi}{2} = -\frac{\pi}{2} \rightarrow u = -\frac{\pi}{2\pi}$$

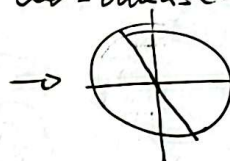
$$\rightarrow AC = \frac{\pi}{\lambda} + \frac{\pi}{\lambda} = \frac{\pi}{\lambda}$$

$$y_D=1 \rightarrow \delta = \frac{\pi}{2} \times \frac{1}{2} = \frac{\pi}{4}$$

$$\log \frac{\sin \alpha}{\cos \alpha} = \log 3 \rightarrow \log \frac{\sin \alpha}{\cos \alpha} = \log 3 \rightarrow \frac{\sin \alpha}{\cos \alpha} = 3 \rightarrow \tan \alpha = 3 \rightarrow \alpha = \arctan 3$$



$$\sin \alpha = \frac{3}{\sqrt{10}}, \cos \alpha = \frac{1}{\sqrt{10}} \rightarrow \sin \alpha + \cos \alpha = \frac{3+1}{\sqrt{10}} = \frac{4}{\sqrt{10}} = \frac{2\sqrt{10}}{5}$$



در مثل قائم الزاویه α و β داریم $\frac{3}{4} = \sin \alpha$ و $\frac{1}{4} = \cos \alpha$

$$\frac{1}{4} \rightarrow \frac{\pi}{4} - \frac{\pi}{4} \sin \alpha - \frac{1}{2} \cos^2 \alpha = \frac{\pi}{4} - \frac{\pi}{4} \sin \alpha + \frac{1}{2} \sin^2 \alpha - \frac{1}{2} = 0$$

$$14 - 2\pi t + 9t^2 - 9 = 0 \rightarrow 9t^2 - 2\pi t + 5 = 0 \rightarrow t^2 - \frac{2\pi}{9}t + \frac{5}{9} = 0 \rightarrow t = \frac{\pi}{9}, \frac{\pi}{9}$$

$$\sin \alpha = \frac{1}{2} \rightarrow \cos \alpha = \pm \frac{\sqrt{3}}{2} \rightarrow \cos^2 \alpha = \frac{3}{4} \rightarrow \frac{1}{\cos^2 \alpha} = \frac{4}{3}$$

$$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$$

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$$\frac{\pi}{8} = \sin \frac{\pi}{4} \sin \alpha + 1 = \sin \alpha - \frac{1}{2} \sin \alpha + 1 + \sin \alpha$$

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

$$\sin(\pi + \cos \alpha) < 0 \rightarrow \sin \alpha < 0 \rightarrow \frac{\sin \alpha}{\cos \alpha} < \frac{1}{\cos \alpha} \rightarrow -\frac{\cos \alpha}{\cos \alpha} = -1 < \cos \alpha$$

$$\rightarrow \cos \alpha > \sin \alpha \rightarrow \frac{\pi}{4} < \alpha < \frac{3\pi}{4}$$

$$\frac{r \cos \alpha + r \sin \alpha}{\sin \alpha \cos \alpha} = 0 \rightarrow r \cos \alpha = -r \sin \alpha \rightarrow \tan \alpha = -\frac{r}{r} \rightarrow \tan \alpha = -1$$

$$\rightarrow \tan \alpha + \tan \alpha = \frac{1}{r} - \frac{r}{r} = \frac{1-r}{r} = \frac{-1-r}{r}$$

$$A = \frac{r \cos \alpha + r \sin \alpha}{\sin \alpha \cos \alpha}$$

$$\frac{\sqrt{1+\cos \alpha}}{\cos \alpha + \cos \alpha} = \frac{\sqrt{r} \cos \alpha}{-1 \cdot \cos \alpha + \cos \alpha} = \frac{\sqrt{r} \cos \alpha}{r \cos \alpha + \cos \alpha - 1}$$

$$\frac{\sqrt{r} \cos \alpha}{(r-1)(1+1)} = \frac{\sqrt{r} \cos \alpha}{(r \cos \alpha - 1)(r \cos \alpha)} = \frac{\sqrt{r}}{r} \times \frac{1}{(r \cos \alpha - 1) \cos \alpha} = \frac{\sqrt{r}}{r} \times \frac{1}{r \cos \alpha - 1 \cos \alpha}$$

$$= \frac{\sqrt{r}}{r} \times \frac{1}{\cos \alpha} = \frac{\sqrt{r}}{r \cos \alpha}$$

$$A = \cos \alpha \cdot \cos \alpha \cdot \cos \alpha \rightarrow A = \frac{\sin \alpha}{\sin \alpha} \cos \alpha \cdot \cos \alpha \cdot \cos \alpha \rightarrow A = \frac{\sin \alpha \cdot \cos \alpha \cdot \cos \alpha}{r \sin \alpha}$$

$$= \frac{\cos \alpha \cdot \sin \alpha}{r \sin \alpha} = \frac{\sin \alpha}{r \sin \alpha} = \frac{1}{r} \frac{\cos \alpha}{\sin \alpha} = \frac{1}{r} \cot \alpha$$

$$a \sin \alpha + b \cos \alpha = \frac{a}{\tan \alpha} + b \cos \alpha = \frac{a}{\tan \alpha} + b \cos \alpha = \frac{a}{\tan \alpha} + b \cos \alpha$$

$$\sin \alpha = r \cos \alpha \rightarrow \sin \alpha = r \cos \alpha - 1 \cos \alpha + 1 \rightarrow 1 = 1 \cos \alpha - 1 \cos \alpha + 1$$

$$1 = 1 \cos \alpha - 1 \cos \alpha + 1 \rightarrow r = 1 \cos \alpha - 1 \cos \alpha$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \rightarrow \frac{a}{\sin A} = \frac{bc}{\sin B \sin C} = \frac{bc}{\cos \frac{A}{2}} = \frac{a}{\sin \frac{A}{2}} = \frac{a}{\sin \frac{A}{2} \cos \frac{A}{2}}$$

$$\rightarrow bc = \frac{a}{\sin \frac{A}{2}} \rightarrow bc(1 - \cos A) = a^2 \rightarrow bc - bc \cos A = a^2 \rightarrow bc - bc \cos A = a^2$$

$$a^2 = b^2 + c^2 - 2bc \cos A \rightarrow bc - bc \cos A = b^2 + c^2 - 2bc \cos A \rightarrow b^2 + c^2 - bc = 0 \rightarrow b = c \rightarrow \hat{B} = \hat{C} = 45^\circ \rightarrow A = 90^\circ$$