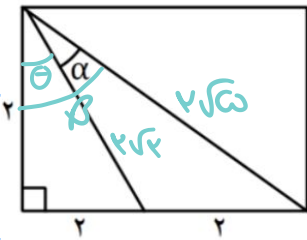


$$\frac{r\sqrt{r}}{r\sqrt{r+1}} = \frac{1}{\sqrt{r+1}} \times \sqrt{r} \times \frac{r}{r} \sin \alpha \Rightarrow \frac{r}{r\sqrt{r+1}} = \sin \alpha$$

$$\frac{r\sqrt{r}}{r\sqrt{r+1}} = \sin \alpha \Rightarrow \sin \alpha = \frac{\sqrt{r}}{\sqrt{r+1}} \Rightarrow \alpha = 90^\circ \text{ یا } 180^\circ$$

$$\frac{180}{90} = 2 \Rightarrow 2$$



$$\sin \beta = \frac{r}{r\sqrt{2}} \quad \cos \beta = \frac{r}{r\sqrt{2}}$$

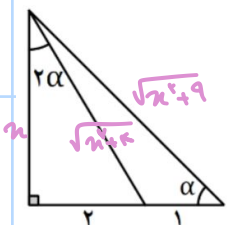
$$\sin \theta = \frac{r}{r\sqrt{r}} \quad \cos \theta = \frac{r}{r\sqrt{r}}$$

$$\sin(\alpha) = \sin(\beta - \theta) = \sin \beta \cos \theta - \cos \beta \sin \theta$$

$$\sin \alpha = \frac{r\sqrt{2}}{r\sqrt{2}} \times \frac{r\sqrt{r}}{r} - \frac{r\sqrt{2}}{r\sqrt{2}} \times \frac{r\sqrt{r}}{r} = \frac{r\sqrt{10}}{r_0} - \frac{r\sqrt{10}}{r_0} = \frac{\sqrt{10}}{10}$$

$$\sin^2 \alpha + \cos^2 \alpha = 1 \Rightarrow \frac{10}{100} + \cos^2 \alpha = 1 \Rightarrow \cos^2 \alpha = \frac{90}{100} \Rightarrow \cos \alpha = \frac{r\sqrt{10}}{10}$$

$$\cos \alpha = \frac{\frac{r\sqrt{10}}{10}}{\frac{\sqrt{10}}{10}} = 2 \Rightarrow 2$$



$$\sin \alpha = \frac{n}{\sqrt{n^2+1}}$$

$$\cos \alpha = \frac{1}{\sqrt{n^2+1}} \Rightarrow \cot \alpha = \frac{1}{n}$$

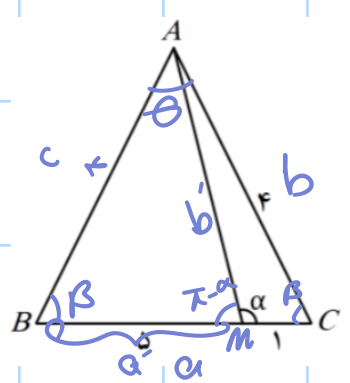
$$\sin \alpha = \frac{n}{\sqrt{n^2+1}}$$

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

$$\frac{\cos \alpha}{\sin \alpha} = \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha} \cdot \frac{1}{\tan \alpha} \Rightarrow \frac{1 - \tan^2 \alpha}{\tan \alpha (1 + \tan^2 \alpha)} \Rightarrow \frac{1 - \tan^2 \alpha}{\tan \alpha} \cdot \frac{1}{1 + \tan^2 \alpha}$$

$$\Rightarrow \frac{1}{\tan \alpha} \cdot \frac{1 - \tan^2 \alpha}{1 + \tan^2 \alpha} \Rightarrow \frac{1 - \tan^2 \alpha}{\tan \alpha (1 + \tan^2 \alpha)} \Rightarrow \frac{1 - \tan^2 \alpha}{\tan \alpha} \cdot \frac{1}{1 + \tan^2 \alpha}$$

$$\cot \alpha = \frac{1}{\tan \alpha} = \frac{1}{\frac{1}{\sqrt{3}}} \Rightarrow \cot \alpha = \sqrt{3}$$



$$\sin \alpha = \sin(\pi - \alpha) \quad \cos \alpha =$$

$$c^2 = a^2 + b^2 - 2ab \cos \beta \Rightarrow 14 = 1 + 11 - 2 \cdot 1 \cdot \sqrt{11} \cos \beta \Rightarrow 14 = 12 - 2\sqrt{11} \cos \beta \Rightarrow 2 = -2\sqrt{11} \cos \beta \Rightarrow \cos \beta = -\frac{1}{\sqrt{11}}$$

$$b^2 = c^2 + a^2 - 2ac \cos \beta \Rightarrow b^2 = 14 + 1 - 2 \cdot 1 \cdot \sqrt{11} \cdot \left(-\frac{1}{\sqrt{11}}\right) \Rightarrow b^2 = 11$$

$$14 = 1 + 11 - 2\sqrt{11} \cos \alpha \Rightarrow 2 = -2\sqrt{11} \cos \alpha \Rightarrow \cos \alpha = -\frac{1}{\sqrt{11}}$$

$$\cos^2 \alpha + \sin^2 \alpha = 1 \Rightarrow \frac{1}{11} + \sin^2 \alpha = 1 \Rightarrow \sin^2 \alpha = \frac{10}{11} \Rightarrow \sin \alpha = \frac{\sqrt{10}}{\sqrt{11}}$$

tan alpha > 0

$$\tan \alpha = \frac{\frac{\sqrt{10}}{\sqrt{11}}}{-\frac{1}{\sqrt{11}}} = -\sqrt{10}$$

$$\cancel{r \sin^r \alpha + \cos^r \alpha} = \frac{r}{r} \rightarrow \sin^r \alpha = \frac{1}{r}$$

ec

$$\sin^r \alpha = \frac{1}{r} \quad \boxed{\frac{1}{r}}$$

$$\cancel{r \cos^r \alpha + \sin^r \alpha} = 1 \rightarrow \cos^r \alpha = \frac{1}{r}$$

-B

$$\frac{(1 - \cos^r \alpha)^r \sin^r \alpha + r \cos^r \alpha}{1 + \cos^r \alpha} \quad \frac{(1 - \sin^r \alpha)^r \cos^r \alpha + r \sin^r \alpha}{1 + \sin^r \alpha} \rightarrow$$

ec

$$\begin{aligned} & \frac{1 + \cos^r \alpha - r \cos^r \alpha + r \cos^r \alpha}{1 + \cos^r \alpha} \rightarrow \frac{\cos^r \alpha + r \cos^r \alpha + 1}{1 + \cos^r \alpha} \rightarrow \frac{(1 + \cos^r \alpha)^r}{1 + \cos^r \alpha} \\ & \frac{1 + \sin^r \alpha - r \sin^r \alpha + r \sin^r \alpha}{1 + \sin^r \alpha} \rightarrow \frac{\sin^r \alpha + r \sin^r \alpha + 1}{1 + \sin^r \alpha} \rightarrow \frac{(1 + \sin^r \alpha)^r}{1 + \sin^r \alpha} \end{aligned}$$

$$1 + \cos^r \alpha - 1 - \sin^r \alpha = \cos^r \alpha - \sin^r \alpha = \cos^r \alpha \quad \boxed{\cos^r \alpha}$$

$$\underbrace{\sin\left(\frac{9\pi}{4} + \alpha\right)}_{\cos(\alpha)} \underbrace{\cos\left(\frac{5\pi}{4} - \alpha\right)}_{-\sin(\alpha)} - \underbrace{\tan\left(\alpha - \frac{3\pi}{4}\right)}_{-\cot(\alpha)}$$

reV

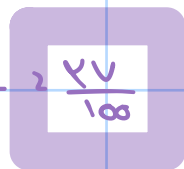
$$\cos \alpha - \sin \alpha + \cot \alpha$$

$$\tan \alpha = \frac{r}{r} \quad \cot \alpha = \frac{r}{r}$$

$$1 + \tan^2 = \frac{1}{\cos^2} \rightarrow \frac{3}{4} = \frac{1}{\cos^2} \rightarrow \cos \alpha = \frac{2}{3} \quad \sin \alpha = \frac{r}{3}$$



$$\frac{2}{3} \times \frac{r}{3} + \frac{r}{r} = \frac{2r}{9} + \frac{r}{r} = \frac{2r - r}{9} = \frac{r}{9}$$



$$\frac{1}{\frac{r}{r}} \times \frac{r}{r} = 1$$

reV

$$r \cos \theta_0 + \sqrt{r} \sin \theta_0 - \sqrt{r} \cos \theta_0 \rightarrow \frac{r}{r} - \sqrt{r} \left(\frac{\cos \theta_0 - \sin \theta_0}{\cos \theta_0 + \sin \theta_0} \right)$$

$$\rightarrow \frac{r}{r} - \sqrt{r} \left(\frac{\cos \frac{\pi}{4}}{\sqrt{r} \sin\left(\frac{\pi}{4} + \frac{\pi}{4}\right)} \right) = \frac{r}{r} - \frac{\sqrt{r}}{\sqrt{r}} = \frac{r}{r} - 1 = \frac{1}{r}$$

$$\tan \frac{\alpha}{4} = \frac{1}{r} \rightarrow \tan \alpha = \frac{r \tan \frac{\alpha}{4}}{1 - \tan^2 \frac{\alpha}{4}}$$

reV

$$\tan \alpha = \frac{\frac{r}{r}}{1 - \frac{1}{r^2}} \rightarrow \tan \alpha = \frac{\frac{r}{r}}{\frac{r^2 - 1}{r^2}} = \frac{r}{r^2 - 1}$$

$$1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow 1 + \frac{4}{9} = \frac{1}{\cos^2 \alpha} \Rightarrow \frac{13}{9} = \frac{1}{\cos^2 \alpha} \Rightarrow \cos \alpha = \frac{3}{\sqrt{13}}$$

$$\sin \alpha = \frac{\sin \alpha}{\cos \alpha} \Rightarrow \frac{1}{\sqrt{13}} = \frac{\sin \alpha}{\frac{3}{\sqrt{13}}} \Rightarrow \sin \alpha = \frac{1}{3}$$

$$\frac{\tan \alpha - \sin \alpha}{\sin \alpha - \cos \alpha} = \frac{\frac{1}{3} - \frac{1}{\sqrt{13}}}{\frac{1}{\sqrt{13}} - \frac{3}{\sqrt{13}}} = \frac{\frac{1(\sqrt{13}-3)}{3\sqrt{13}}}{\frac{1-3}{\sqrt{13}}} = \frac{\frac{1(\sqrt{13}-3)}{3\sqrt{13}}}{-\frac{2}{\sqrt{13}}} = \frac{1(\sqrt{13}-3)}{3 \cdot (-2)} = \frac{3-\sqrt{13}}{6}$$

$$0 < \frac{\cos \alpha}{\sin \alpha} \Rightarrow \cos \alpha, \sin \alpha > 0 \Rightarrow \cos \alpha > 0$$

1.1.1

$$\cos \alpha < 0, \sin \alpha < 0 \Rightarrow \cos \alpha > 0$$

1.1.2

$$\sin \alpha < \sin \alpha \Rightarrow \sin \alpha < \sin \alpha \cos \alpha \Rightarrow \sin \alpha < \sin \alpha \cos \alpha$$

$$\sin \alpha - \sin \alpha \cos \alpha < 0 \Rightarrow \sin \alpha (1 - \cos \alpha) < 0 \Rightarrow \sin \alpha < 0$$

$-1 \leq \cos \alpha \leq 1$
 \uparrow
 1.1.3

1.1.1, 1.1.2, 1.1.3

