

$$\text{الف) } \tan^{-1} \frac{1}{\sqrt{3}} + \sin^{-1} \frac{\sqrt{3}}{2} + \cos^{-1} \frac{\sqrt{3}}{2} = -1 + \frac{1}{2} = -\frac{1}{2}$$

$$\text{ب) } \tan^{-1} \frac{1}{\sqrt{3}} + \sin^{-1} \frac{\sqrt{3}}{2} + \cos^{-1} \frac{\sqrt{3}}{2} = \frac{1}{2} + \frac{1}{2} = 1$$

$$\cot^2 n = 16 \rightarrow 1 + 16 = \frac{1}{\sin^2 n} \Rightarrow \sin n = \frac{1}{\sqrt{17}} \text{ و } \cos n = \frac{4}{\sqrt{17}}$$

$$\rightarrow \frac{\frac{12}{\sqrt{17}}}{\frac{4}{\sqrt{17}} + \frac{1}{\sqrt{17}}} = \frac{\frac{12}{\sqrt{17}}}{\frac{5}{\sqrt{17}}} = \boxed{\frac{12}{5}}$$

$$\tan a = 2 \rightarrow 1 + 4 = \frac{1}{\cos^2 a} \Rightarrow \cos a = \frac{1}{\sqrt{5}}$$

ب. چون باید که در ربع سوم $\rightarrow \boxed{\cos a = -\frac{1}{\sqrt{5}} = -\frac{\sqrt{5}}{5}}$

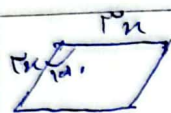
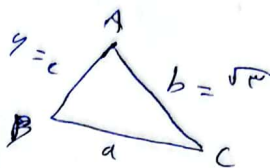
$$1 + \sin^2 n = \frac{5}{4} \Rightarrow \sin^2 n = \frac{1}{4} \Rightarrow \cos^2 n = \frac{3}{4}$$

$$\Rightarrow \tan^2 n = \frac{\sin^2 n}{\cos^2 n} = \frac{\frac{1}{4}}{\frac{3}{4}} = \boxed{\frac{1}{3}}$$

$$\frac{1}{r} \times \sqrt{r} \times \sqrt{r} \sin \alpha = r \sin \alpha \Rightarrow \sin \alpha = \frac{r \sin \alpha}{\frac{r}{\sqrt{r}}} = \frac{r \sin \alpha}{\sqrt{r}} = \frac{r \sin \alpha \sqrt{r}}{r} = \frac{\sqrt{r}}{r} \Rightarrow \alpha = 45^\circ$$

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

$$\frac{a}{\frac{\sqrt{r}}{r}} = \frac{\sqrt{r}}{\sin B} \Rightarrow \frac{a \times r}{\sqrt{r}} = \frac{\sqrt{r}}{\sin B} \Rightarrow a \times \sin B = \frac{1}{r}$$

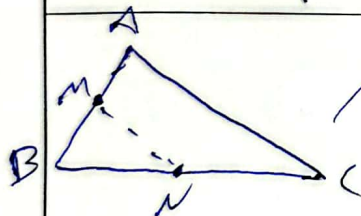


$$\Rightarrow \frac{1}{r} \times \sqrt{r} \times \sqrt{r} = \frac{1}{r} \Rightarrow \sqrt{r} = \frac{1}{r} \Rightarrow r = 1 \Rightarrow n = \sqrt{1} = 1$$

$$\Rightarrow r(\sqrt{1}) + r(\sqrt{1}) = 1 \cdot \sqrt{1} = r \cdot \sqrt{1} = \sqrt{r}$$

$$\left. \begin{aligned} \frac{1}{r} \times V \times r \sin \alpha &= l \sin \alpha \\ \frac{1}{r} \times V \times d \sin \alpha &= l \sin \alpha \end{aligned} \right\} \Rightarrow \sin \alpha = \frac{l \sin \alpha}{\frac{1}{r} \times V \times r} = \frac{1}{r} \Rightarrow \alpha = 30^\circ$$

$$\left. \begin{aligned} \sin 30^\circ &= \frac{1}{2} \\ \cos 30^\circ &= \frac{\sqrt{3}}{2} \end{aligned} \right\} \tan 30^\circ = \frac{\sin 30^\circ}{\cos 30^\circ} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$



$$\frac{1}{r} \times AB \times \frac{1}{r} \times \sin B = \frac{1}{r} \times \frac{1}{r} \times BM \times \sin B$$

$$\Rightarrow \frac{a}{r} AB = BM \Rightarrow \frac{BM}{AB} = \frac{a}{r}$$

$$\rightarrow AM = \frac{r}{a} BM \Rightarrow \frac{BM}{AM} = \frac{a}{r}$$

$$\frac{1 + \sin \alpha}{1 + \cos \alpha} \Rightarrow \text{قوس}$$

$$\boxed{r = 1} \Rightarrow \begin{cases} \cos \alpha \\ \sin \alpha \end{cases}$$

$$\frac{1 - \sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{1 + \cos \alpha} \Rightarrow \cos \alpha = \frac{1 + \sin \alpha}{1 + \cos \alpha} \Rightarrow \frac{1 + \sin \alpha}{\cos \alpha} = \frac{1}{\cot \alpha} \Rightarrow \cot \alpha = \frac{1}{1 + \sin \alpha}$$