

$$\text{الف)} \tan 225^\circ + \sin 315^\circ \cdot \cos 225^\circ = (-1) + \left(-\frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{2}\right) = -\frac{1}{2} - 1$$

$$\text{ب)} \tan 135^\circ \cdot \sin 225^\circ + \cos 225^\circ = -\frac{1}{\sqrt{2}} \cdot \left(-\frac{\sqrt{2}}{2}\right) + \left(-\frac{1}{2}\right) = 0$$

$$\cot x = 5 \Rightarrow \frac{5 \cos x - \sin x + \sin x}{\cos x + \sin x} \rightarrow \frac{5 \cot x - 1}{1 \cot x + 1} = \frac{12-1}{5+1} = \frac{11}{6}$$

$$\sin x = 2 \cos x \Rightarrow \sqrt{1 - \cos^2 x} = 2 \cos x \Rightarrow 1 - \cos^2 x = 4 \cos^2 x$$

$$\Rightarrow 1 = 5 \cos^2 x \Rightarrow \cos^2 x = \frac{1}{5} \Rightarrow \cos x = \pm \frac{\sqrt{5}}{5} \Rightarrow -\frac{\sqrt{5}}{5}$$

غیر قابل قبول چون ربع دوم است

الف)

$$\cos\left(\frac{11\pi}{6} + \alpha\right) \rightarrow \cos \frac{11\pi}{6} \cdot \cos \alpha - \sin \frac{11\pi}{6} \times \sin \alpha = \sin \alpha$$

$$\sin \alpha = \frac{\sqrt{3}}{2} \Rightarrow \sqrt{1 - \cos^2 \alpha} = \frac{\sqrt{3}}{2} \Rightarrow 1 - \cos^2 \alpha = \frac{3}{4}$$

$$\cos^2 \alpha = \frac{1}{4} \Rightarrow \cos \alpha = \pm \frac{1}{2} \xrightarrow{\text{ربع اول است}} \frac{1}{2}$$

$$\left(-\frac{\sqrt{3}}{2} \cdot \frac{1}{2} - \frac{1}{2} \cdot \frac{\sqrt{3}}{2}\right) - \left(\frac{\sqrt{3}}{2} \cdot \frac{1}{2} - \frac{1}{2} \cdot \frac{\sqrt{3}}{2}\right) = 0/4$$

$$\text{ب)} \sin\left(\frac{13\pi}{6} + \alpha\right) = \sin \frac{13\pi}{6} \times \cos \alpha + \cos \frac{13\pi}{6} \times \sin \alpha$$

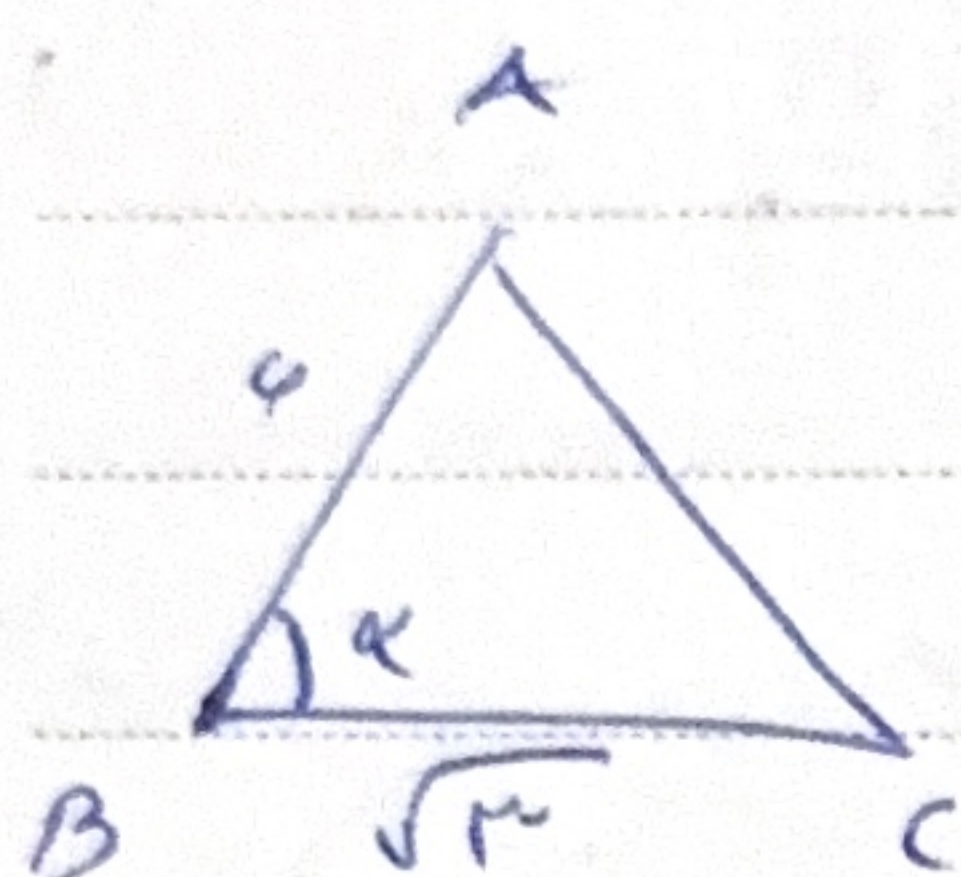
$$\frac{1}{\cos^2 \alpha} = 1 + \frac{1}{4} \Rightarrow \frac{1}{\cos^2 \alpha} = \frac{5}{4} \Rightarrow \cos^2 \alpha = \frac{4}{5}$$

$$\Rightarrow \cos \alpha = \pm \frac{2}{\sqrt{5}} \xrightarrow{\text{ربع اول است}} \frac{2}{\sqrt{5}} \Rightarrow \sin \alpha = \frac{1}{\sqrt{5}}$$

$$\left(-\frac{\sqrt{3}}{2} \cdot \frac{1}{\sqrt{5}}\right) + \left(-\frac{\sqrt{3}}{2} \cdot \frac{2}{\sqrt{5}}\right) = -\frac{3\sqrt{3}}{2\sqrt{5}}$$

$$r \sin^2 \alpha + (1 - \sin^2 \alpha) = \frac{r}{r} \Rightarrow r \sin^2 \alpha + 1 - \sin^2 \alpha = \frac{r}{r} \Rightarrow \sin^2 \alpha = \frac{1}{r} \quad -8$$

$$\Rightarrow \cos^2 \alpha = \frac{r}{r} (\sin^2 \alpha + \cos^2 \alpha = 1) \Rightarrow \tan^2 \alpha = \frac{\frac{1}{r}}{\frac{r}{r}} = \frac{1}{r} \quad \left(\frac{1}{r} \right)$$



$$\frac{1}{r} \times 4 \times \sqrt{r} \times \sin \alpha = 18 \quad \frac{1}{r} \times 4 \times \sqrt{r} \quad -9$$

$$\Rightarrow \sqrt{r} \times \sin \alpha = 18 \Rightarrow \sin \alpha = \frac{18\sqrt{r}}{\sqrt{r} \cdot \sqrt{r}} = \frac{18\sqrt{r}}{r}$$

$$\Rightarrow \frac{\sqrt{r}}{4} = \frac{\sqrt{r}}{r} \Rightarrow \alpha = 45^\circ, 135^\circ \quad \frac{18}{4} = \frac{r}{r}$$

$$a \times b \times \sin 180^\circ = 88 \Rightarrow a \cdot b \cdot \frac{1}{r} = 88 \Rightarrow a \cdot b = 1.1 \quad -10$$

$$\left\{ \frac{a}{b} = \frac{r}{r} \Rightarrow b = \frac{ra}{r} \right\}$$

$$\Rightarrow \frac{ra}{r} = 1.1 \Rightarrow \frac{ra}{r} = 1.1 \Rightarrow ra = 1.1r \Rightarrow a = \sqrt{r} \Rightarrow a = \sqrt{r}$$

$$\Rightarrow a = 4\sqrt{r} \quad \left\{ r(4\sqrt{r} + 4\sqrt{r}) = 88 \sqrt{r} \rightarrow \frac{88}{2} \right.$$

$$S_{ABC} = S_{ADE} = 1.1 \Rightarrow \frac{1}{r} \cdot 8 \cdot \sqrt{r} \cdot \sin \hat{A} = \frac{1}{r} \cdot \sqrt{r} \cdot r \cdot \sin \hat{A} = 1.1 \quad -11$$

$$\frac{8}{r} \sin \hat{A} = 1.1 \sin \hat{A} = 1.1 \Rightarrow 8 \sin \hat{A} = 1.1 \sqrt{r}$$

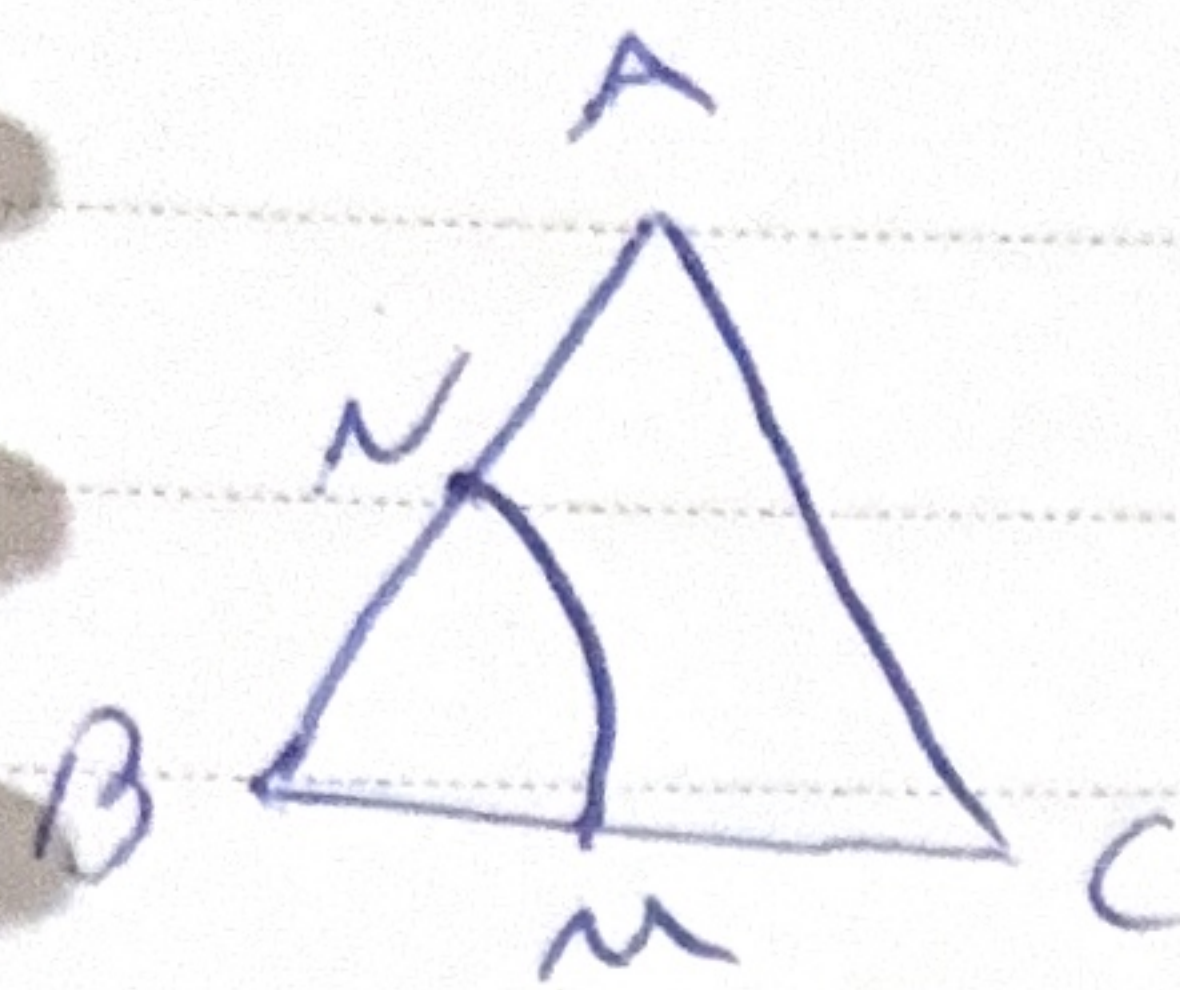
$$\Rightarrow r \sin \hat{A} = 1 \Rightarrow \sin \hat{A} = \frac{1}{r}$$

$$\cos \hat{A} = \sqrt{1 - \sin^2 \hat{A}} = \sqrt{1 - \frac{1}{r}} = \sqrt{\frac{r-1}{r}} = \frac{\sqrt{r-1}}{\sqrt{r}}$$

$$\tan \hat{A} = \frac{\frac{1}{r}}{\frac{\sqrt{r-1}}{\sqrt{r}}} = \frac{1}{\sqrt{r}} = \frac{\sqrt{r}}{r} \quad \left(\frac{\sqrt{r}}{r} \right)$$

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$$\sqrt{BN} \cdot \sqrt{NC} = \sqrt{BC} \cdot \sqrt{BN}$$

A

$$\frac{1}{\sqrt{c}} \cdot AB \cdot BC \cdot \sin B = \frac{1}{\sqrt{c}} \cdot BM \cdot BN \cdot \sin B$$

$$\Rightarrow (BM + AM) \cdot \sqrt{BN} \cdot \sqrt{NC} = \sqrt{c} \cdot BM \cdot BN$$

$$\Rightarrow (BM + AM) \cdot \left(\frac{\sqrt{c}}{\sqrt{c}} \sqrt{BN} \right) = \sqrt{c} \cdot BM \cdot \frac{\sqrt{c}}{\sqrt{c}} \sqrt{BN}$$

$$\Rightarrow \frac{\sqrt{c}}{\sqrt{c}} (BM + AM) = \sqrt{c} \cdot BM \Rightarrow \frac{\sqrt{c}}{\sqrt{c}} BM + \frac{\sqrt{c}}{\sqrt{c}} AM = \sqrt{c} \cdot BM$$

$$\Rightarrow \frac{\sqrt{c}}{\sqrt{c}} AM = \sqrt{c} \cdot BM \Rightarrow \frac{AM}{BM} = \frac{\sqrt{c}}{\sqrt{c}}$$

Ans: 1.