

$$\text{الف) } \tan \frac{11\pi}{4} + \sin \frac{15\pi}{4} \cos \frac{13\pi}{4} = \tan \frac{5\pi}{4} + \sin \frac{7\pi}{4} \cos \frac{9\pi}{4} = \tan_{135^\circ} + \sin_{225^\circ} \cos_{45^\circ} = -1 + \frac{-\sqrt{2}}{2} \times \frac{\sqrt{2}}{2} = \frac{-1}{2}$$

$$\text{ب) } \tan \frac{13\pi}{4} \sin \frac{11\pi}{4} + \cos \frac{13\pi}{4} = \tan \frac{5\pi}{4} \sin \frac{7\pi}{4} + \cos \frac{9\pi}{4} = \tan_{135^\circ} \sin_{225^\circ} + \cos_{45^\circ} = \frac{-\sqrt{2}}{2} \times \frac{-\sqrt{2}}{2} + \frac{1}{2} = 0$$

$$\cot \alpha = \frac{f}{\Delta} \Rightarrow \frac{\cos \alpha}{\sin \alpha} = \frac{f}{\Delta} \Rightarrow \cos \alpha = \frac{f}{\Delta} \sin \alpha$$

$$\frac{f \cos \alpha - \sin \alpha}{\cos \alpha + \sin \alpha} = \frac{f \sin \alpha - \sin \alpha}{f \sin \alpha + \sin \alpha} = \frac{11 \sin \alpha}{\Delta \sin \alpha} = \frac{11}{\Delta}$$

$$\sin \alpha = \frac{f}{\Delta} \cos \alpha, 11^\circ < \alpha < 27^\circ$$

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

$$\text{الف) } \cos \left(\frac{11\pi}{4} + \alpha \right) = \cos \left(\frac{5\pi}{4} + \alpha \right) = \cos \frac{5\pi}{4} \cos \alpha - \sin \frac{5\pi}{4} \sin \alpha = \left(\frac{-\sqrt{2}}{2} \times \frac{1}{\Delta} \right) - \left(\frac{\sqrt{2}}{2} \times \frac{f}{\Delta} \right) = \frac{11}{\Delta} = \frac{f}{\Delta}$$

$$\left[\cos \alpha = \frac{1}{\Delta} = \frac{1}{\sqrt{2}} \Rightarrow \alpha = 45^\circ \right]$$

$$\text{ب) } \sin \left(\frac{13\pi}{4} + \alpha \right) = \sin \left(\frac{5\pi}{4} + \alpha \right) = \sin \frac{5\pi}{4} \cos \alpha + \cos \frac{5\pi}{4} \sin \alpha = \left(\frac{-\sqrt{2}}{2} \times \frac{1}{\Delta} \right) + \left(\frac{-\sqrt{2}}{2} \times \frac{f}{\Delta} \right) = \frac{-11}{\Delta} = \frac{-f}{\Delta}$$

$$\left[1 + \tan^2 \alpha = \frac{1}{\cos^2 \alpha} \Rightarrow \frac{f^2}{\Delta^2} = \cos^2 \alpha \Rightarrow \cos \alpha = \frac{f}{\Delta}, \sin \alpha = \tan \alpha \times \cos \alpha = \frac{1}{f} \times \frac{f}{\Delta} = \frac{1}{\Delta} \right]$$

$$\begin{cases} f \sin \alpha + \cos \alpha = \frac{f}{\Delta} \\ \sin \alpha + \cos \alpha = 1 \end{cases} \Rightarrow f \sin \alpha + \cos \alpha - \sin \alpha - \cos \alpha = \sin \alpha = \frac{1}{f} \Rightarrow \cos \alpha = \frac{f}{\Delta}$$

$$\tan^2 \alpha + 1 = \frac{1}{\cos^2 \alpha} \Rightarrow \tan^2 \alpha = \frac{f}{\Delta} - 1 = \frac{1}{f}$$

$$\frac{1}{f} \times a \times b \times \sin c = \frac{1}{f} \times 4 \times \sqrt{f} \times \sin \alpha = f \Delta \Rightarrow \sin \alpha = \frac{f}{\sqrt{f}} = \frac{\sqrt{f}}{f} \Rightarrow \alpha = 45^\circ \text{ یا } 135^\circ$$

$$\frac{11}{40} = \frac{f}{\Delta}$$

$$a \times b \times \sin 135^\circ = \Delta^2 \Rightarrow \frac{f}{\Delta} a^2 \times \frac{1}{f} = \Delta^2 \Rightarrow a^2 = \Delta^2 \Rightarrow a = \Delta, b = \Delta$$

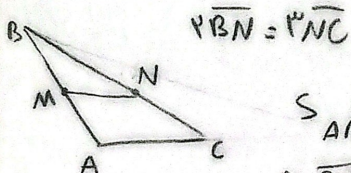
$$\left[\frac{a}{b} = \frac{f}{\Delta} \Rightarrow b = \frac{f}{\Delta} a \right]$$

$$P = f a + \Delta b = 11\sqrt{f} + 11\sqrt{f} = 22\sqrt{f}$$

متوزی الاضلاع

$$\left. \begin{aligned} S_{ABC} &= \Delta \times V \times \sin A \times \frac{1}{f} = \frac{f \Delta}{f} \sin A \\ S_{ADE} &= f \times V \times \sin A \times \frac{1}{f} = 11 \sin A \end{aligned} \right\} S_{ABC} - S_{ADE} = 11 \Delta \sin A = 11 \Delta \Rightarrow \sin A = \frac{1}{f}$$

$$\tan \alpha = \frac{\sqrt{f}}{f} \leftarrow A = 45^\circ$$



$$\overline{BM} = \overline{NC}$$

$$S_{ABC} = 11 S_{BMN} \sim \frac{1}{f} \times \overline{AB} \times \overline{BC} \times \sin B = 11 \times \frac{1}{f} \times \overline{BM} \times \overline{BN} \times \sin B$$

$$\overline{AB} \times \overline{BC} = 11 \times \overline{BM} \times \overline{BN}$$

$$(\overline{BM} + \overline{AM})(\overline{BN} + \overline{NC}) = \overline{BM} \times \overline{BN} \Rightarrow \overline{BM} = \frac{\Delta}{f} (\overline{BM} + \overline{AM}) \Rightarrow \overline{BM} = \Delta \overline{AM} \Rightarrow \frac{\overline{BM}}{\overline{AM}} = \frac{\Delta}{f}$$

$$\frac{1}{\sqrt{\cos^2 a}} - \tan a = \frac{1 + \sin a}{|\cos a|}, \quad \frac{|\sin a|}{\cos a} = -\frac{1}{\cot a}$$

$$\downarrow$$

$$\frac{1}{|\cos a|} - \frac{\sin a}{\cos a} \overset{\cos a < 0}{\sim} = \frac{1 + \sin a}{|\cos a|}$$

$$\downarrow \quad \frac{|\sin a|}{\cos a} = \frac{-\sin a}{\cos a} \rightsquigarrow \boxed{\sin a < 0}$$

انتهای کار a در حالتی که cos a < 0