

$$\text{الف) } \tan \frac{11\pi}{8} + \sin \frac{15\pi}{8} \cos \frac{13\pi}{8} =$$

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$$\tan \left(2\pi + \frac{3\pi}{8} \right) + \sin \left(2\pi + \frac{3\pi}{8} \right) \cos \left(2\pi + \frac{\pi}{8} \right)$$

$$= -1 + \frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{2}} = \boxed{-\frac{1}{2}}$$

$$\text{ب) } \tan \left(\frac{11\pi}{4} \right) \sin \left(\frac{11\pi}{4} \right) + \cos \frac{10\pi}{4}$$

$$= \tan \left(2\pi + \frac{3\pi}{4} \right) \sin \left(2\pi + \frac{3\pi}{4} \right) + \cos \left(2\pi + \frac{\pi}{2} \right)$$

$$= \left(-\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2} \right) + \left(-\frac{1}{2} \right) = \frac{1}{2} - \frac{1}{2} = \boxed{0}$$

$$\frac{r \cos \alpha - \sin \alpha}{\cos \alpha + \sin \alpha} \xrightarrow{\div \sin \alpha} \frac{r \cot \alpha - 1}{1 \cot \alpha + 1} \xrightarrow{\cot = \xi}$$

$$\frac{r(\xi) - 1}{\xi + 1} = \boxed{\frac{11}{5}}$$

$$\sin \alpha = r \cos \alpha \Rightarrow \frac{\sin \alpha}{\cos \alpha} = r \Rightarrow \tan \alpha = r$$

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

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$$\cos \alpha = \pm \sqrt{\frac{1}{r^2 + 1}}$$

$$\text{الف) } \sin^2 \alpha + \cos^2 \alpha = 1$$

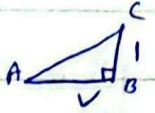
$$\left(\frac{\sqrt{2}}{2} \right)^2 + \cos^2 \alpha = 1 \Rightarrow \cos^2 \alpha = 1 - \frac{2}{4} \Rightarrow \cos^2 \alpha = \frac{2}{4}$$

$$\text{Hashtag} \quad \cos \alpha = \pm \frac{\sqrt{2}}{2}$$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

$$\cos\left(\frac{11\pi}{6} + \alpha\right) = \left(-\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}\right) - \left(\frac{1}{2} \times \frac{1}{2}\right) = \frac{-3}{4} - \frac{1}{4} = \frac{-4}{4} = -1$$

$\frac{11\pi}{6} + \alpha \Rightarrow \cos\left(\frac{11\pi}{6}\right) = -\frac{\sqrt{3}}{2}$

ب) $\tan \alpha = \frac{1}{\sqrt{3}} \Rightarrow$  $AC = \sqrt{1^2 + (\sqrt{3})^2} = \sqrt{4} = 2$

$$\Rightarrow \sin \alpha = \frac{1}{2} = \frac{\sqrt{3}}{2} \quad \Rightarrow \cos \alpha = \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$$

$$\sin(A+B) = \sin A \cos B + \cos A \sin B$$

$$\sin\left(\frac{11\pi}{6} + \alpha\right) = \left(-\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}\right) + \left(\frac{1}{2} \times \frac{1}{2}\right) = \frac{-3}{4} + \frac{1}{4} = \frac{-2}{4} = \frac{-1}{2}$$

$\left(\frac{11\pi}{6} + \alpha\right) \Rightarrow \sin\left(\frac{11\pi}{6}\right) = -\frac{\sqrt{3}}{2}$

$$r \sin^2 \alpha + \cos^2 \alpha = \frac{r}{p}$$

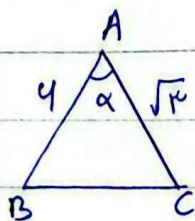
$$\sin^2 \alpha + \sin^2 \alpha + \cos^2 \alpha = \frac{r}{p}$$

$$\sin^2 \alpha = \frac{r}{p} - 1 \Rightarrow \sin^2 \alpha = \frac{1}{p} \Rightarrow \sin^2 \alpha + \cos^2 \alpha = 1$$

$$\cos^2 \alpha = 1 - \frac{1}{p}$$

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

$$\cos^2 \alpha = \frac{p}{p-1}$$



$$S_{ABC} = \frac{1}{2} ab \sin \alpha$$

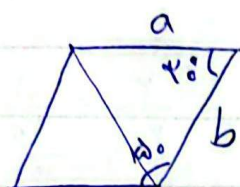
$$E_1 d = \frac{4 \times \sqrt{3}}{2} \sin \alpha$$

$$\frac{E_1 d}{4\sqrt{3}} = \sin \alpha \Rightarrow \sin \alpha = \frac{r}{4\sqrt{3}} = \frac{\sqrt{3}}{4}$$

$$\Rightarrow \alpha \approx 12.0^\circ \text{ یا } 4.0^\circ \text{ نسبت زاویه ها} = \frac{120}{40} = 3$$

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$$S = ab \sin 30^\circ$$

$$\Delta S = ab \times \frac{1}{2}$$

$$\Delta S = 1 \times 1 \times \frac{1}{2}$$

$$k^2 = 1 \Rightarrow k = \sqrt{2}$$



$$a = 4k$$

$$b = 4k$$

$$a = 4\sqrt{2}$$

$$b = 4\sqrt{2}$$

$$P = 2(a+b) = 2(4\sqrt{2} + 4\sqrt{2})$$

$$= 2(8\sqrt{2}) = 16\sqrt{2}$$

$$S_{ABC} = \frac{\Delta \times V}{2} \sin \hat{A}$$

$$S_{AED} = \frac{k \times V}{2} \sin \hat{A}$$

$$\left. \begin{array}{l} S_{ABC} \\ S_{AED} \end{array} \right\} \rightarrow \frac{V\Delta}{2} \sin \hat{A} - \frac{V1}{2} \sin \hat{A} = 1/2 V\Delta$$

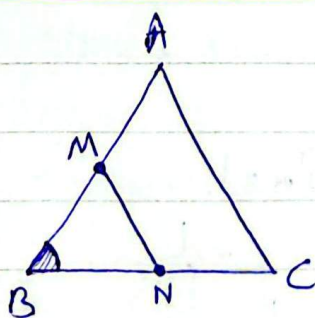
$$\sin \hat{A} \left(\frac{V\Delta}{2} - \frac{V1}{2} \right) = 1/2 V\Delta$$

$$\sin \hat{A} \left(\frac{V}{2} \right) = 1/2 V\Delta$$

$$\sin \hat{A} = \frac{1/2 V\Delta \times 2}{V} = \frac{1}{2}$$

$$\tan \hat{A} = \frac{\sqrt{3}}{1}$$

$$\Leftrightarrow 30^\circ = \hat{A} \text{ not } \leftarrow$$



$$BN = NC$$

$$BN = \frac{1}{2} NC$$

$$AB = AM + MB$$

$$BC = BN + NC = \frac{1}{2} NC + NC = \frac{3}{2} NC$$

$$S_{ABC} = \frac{1}{2} AB \times BC \times \sin \hat{B}$$

$$= \frac{1}{2} BN \times MB \times \sin \hat{B}$$

$$\frac{1}{2} = \frac{(AM + MB) \left(\frac{3}{2} NC \right)}{MB \times \left(\frac{1}{2} NC \right)} \Rightarrow \frac{1}{2} = \frac{\Delta (AM + MB)}{V (MB)}$$

$$\frac{1}{2} = \frac{\Delta AM + \Delta MB}{V MB} \rightarrow 9 MB = \Delta AM + \Delta MB$$

$$8 MB = \Delta AM$$

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$$\rightarrow \frac{BM}{AM} = \frac{1}{8}$$

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$$\frac{1}{\sqrt{\cos^2 \alpha}} - \tan \alpha = \frac{1 + \sin \alpha}{|\cos \alpha|}$$

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$$\rightarrow \frac{1}{|\cos \alpha|} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{|\cos \alpha|}$$

$\cos \alpha > 0$

$$\frac{|\sin \alpha|}{\cos \alpha} = \frac{1}{\cot \alpha} \rightarrow \frac{|\sin \alpha|}{\cos \alpha} = \frac{-\sin \alpha}{\cos \alpha} \Rightarrow \sin \alpha < 0$$

$$\left. \begin{array}{l} \cos \alpha < 0 \\ \sin \alpha < 0 \end{array} \right\} \Rightarrow \boxed{\text{3rd quadrant}}$$

3rd