

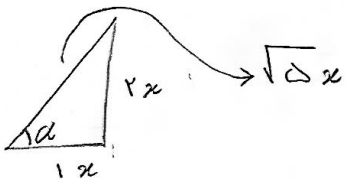
$$1) \tan \frac{11\pi}{8} + \sin \frac{15\pi}{8} \cos \frac{13\pi}{8} = \tan \frac{3\pi}{8} + \sin \frac{5\pi}{8} \cos \frac{5\pi}{8} \rightarrow -1 + \left(-\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2} \right) = -\frac{1}{2}$$

$$2) \tan \frac{17\pi}{8} \sin \frac{11\pi}{8} + \cos \frac{10\pi}{8} = \tan \frac{5\pi}{8} \sin \frac{5\pi}{8} + \cos \frac{5\pi}{8} \rightarrow \left(-\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2} \right) - \frac{1}{2} = 0$$

$$\cot x = \frac{\cos x}{\sin x} = \varepsilon \rightarrow \cos x = \varepsilon a / \sin x = 1a$$

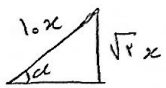
$$\frac{2\cos x - \sin x}{\cos x + \sin x} = \frac{2(\varepsilon a) - 1a}{\varepsilon a + 1a} = \frac{11a}{5a} = \frac{11}{5}$$

$$\sin \alpha = 2 \cos \alpha \quad \tan \alpha = \frac{\sin \alpha}{\cos \alpha} = 2$$



$$\cos \alpha = \frac{\text{مجاور}}{\text{وتر}} = \frac{1}{\sqrt{5}} = \frac{-\sqrt{5}}{5}$$

$$1) \alpha \rightarrow \text{ربع دوم} \quad \sin \alpha = \frac{\sqrt{2}}{10} = \frac{\text{مقابل}}{\text{وتر}}$$



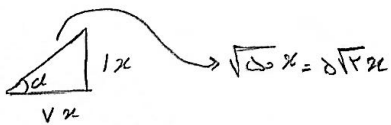
$$\sqrt{102}x = \sqrt{102}x$$

$$\cos \alpha = \frac{\text{مجاور}}{\text{وتر}} = \frac{-\sqrt{102}x}{10x}$$

$$\cos \left(\frac{11\pi}{8} + \alpha \right) = \cos \left(\frac{3\pi}{8} + \alpha \right) = \cos \frac{3\pi}{8} \cos \alpha - \sin \frac{3\pi}{8} \sin \alpha \rightarrow \left(-\frac{\sqrt{2}}{2} \right) \left(-\frac{\sqrt{102}}{10} \right) - \left(\frac{\sqrt{2}}{2} \right) \left(\frac{\sqrt{2}}{10} \right)$$

$$\rightarrow \frac{1}{10} - \frac{1}{10} = \frac{0}{10} = \frac{0}{5}$$

$$2) \alpha \rightarrow \text{ربع اول} \quad \tan \alpha = \frac{1}{\sqrt{2}} = \frac{\text{مقابل}}{\text{مجاور}}$$



$$\sin \alpha = \frac{\text{مقابل}}{\text{وتر}} = \frac{1x}{\sqrt{5}x} = \frac{\sqrt{2}}{10} \quad \cos \alpha = \frac{\text{مجاور}}{\text{وتر}} = \frac{\sqrt{2}x}{\sqrt{5}x} = \frac{\sqrt{2}}{10}$$

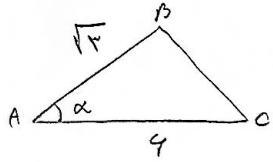
$$\sin \left(\frac{13\pi}{8} + \alpha \right) = \sin \left(\frac{5\pi}{8} + \alpha \right) = \sin \frac{5\pi}{8} \cos \alpha + \sin \alpha \cos \frac{5\pi}{8} \rightarrow \left(-\frac{\sqrt{2}}{2} \right) \left(\frac{\sqrt{2}}{10} \right) + \left(\frac{\sqrt{2}}{10} \right) \left(-\frac{\sqrt{2}}{2} \right)$$

$$\rightarrow \left(-\frac{\sqrt{2}}{2} \right) \left(\frac{\sqrt{2}}{10} + \frac{\sqrt{2}}{10} \right) = -\frac{1}{10} = -\frac{1}{5}$$

$$3 \sin^2 x + \cos^2 x = \frac{5}{4} \rightarrow \sin^2 x + \underbrace{\sin^2 x + \cos^2 x}_1 = \frac{5}{4} \rightarrow \sin^2 x = \frac{1}{4} \rightarrow \sin x = \frac{1}{\sqrt{4}} \quad -\Delta$$

$$\frac{1}{4} + \cos^2 x = 1 \rightarrow \cos^2 x = \frac{3}{4} \rightarrow \cos x = \frac{\sqrt{3}}{\sqrt{4}}$$

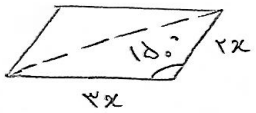
$$\tan^2 x = \left(\frac{\frac{1}{\sqrt{4}}}{\frac{\sqrt{3}}{\sqrt{4}}} \right)^2 = \frac{1}{3} \quad \checkmark$$



$$S_{ABC} = \frac{1}{2} \times \sqrt{4} \times 4 \times \sin \alpha = 5 \Delta$$

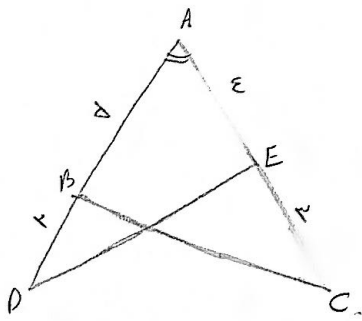
$$\sin \alpha = \frac{4}{5} \times \frac{1}{\sqrt{4}} = \frac{2}{\sqrt{4}} = \frac{\sqrt{3}}{2} \rightarrow \text{بناظر بر دایره یونیت} \rightarrow \alpha = 4^\circ \text{ or } \alpha = 14^\circ$$

$$\frac{14^\circ}{4^\circ} = 2 \quad \checkmark$$



$$S_{\square} = 2 \left(\frac{1}{2} \times 2x \times 2x \times \sin 10^\circ \right) = 2 \epsilon \rightarrow 2x^2 = 2 \epsilon \rightarrow x^2 = 1 \rightarrow x = \sqrt{2}$$

$$P_{\square} = 2 \left(\frac{2(\sqrt{2})}{4\sqrt{2}} + \frac{2(\sqrt{2})}{4\sqrt{2}} \right) = \frac{2\sqrt{2}}{10\sqrt{2}} \quad \checkmark$$

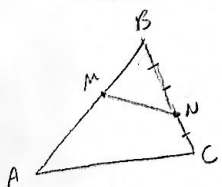


$$S_{ABC} - S_{ADE} = 1, \Delta$$

$$\left(\frac{1}{2} \times 3 \times 3 \times \sin \hat{A} \right) - \left(\frac{1}{2} \times 1 \times 1 \times \sin \hat{A} \right) = 1, \Delta$$

$$\sin \hat{A} \left(\frac{9 - 1}{2} \right) = 1, \Delta \rightarrow \sin \hat{A} = \frac{1}{4} \xrightarrow{0 < \hat{A} < 90^\circ} \hat{A} = 3^\circ$$

$$\tan 3^\circ = \frac{1}{\sqrt{4}} = \frac{\sqrt{3}}{2} \quad \checkmark$$



$$\frac{S_{BMN}}{S_{ABC}} = \frac{1}{4} \rightarrow \frac{\frac{1}{2} \times BM \times BN \times \sin \hat{B}}{\frac{1}{2} \times AB \times BC \times \sin \hat{B}} = \frac{1}{4} \rightarrow \frac{BM}{AB} \times \left(\frac{BN}{BC} \right) = \frac{1}{4}$$

$$\frac{BM}{AB} = \frac{1}{4} \rightarrow \frac{BM}{AM} = \frac{1}{3} \quad \checkmark$$

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

$$\xrightarrow{\cos \alpha \neq 0} |\sin \alpha| = -\sin \alpha \quad -10$$

α در ربع سف-یا چپ $\leftarrow \sin \alpha < 0$

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

باقی ماندنی $\sin \alpha < 0$

$$\begin{cases} \xrightarrow{\text{ربع سف}} |\cos \alpha| = -\cos \alpha \\ \xrightarrow{\text{ربع چپ}} |\cos \alpha| = \cos \alpha \end{cases}$$

برای ربع سف: $\frac{1}{-\cos \alpha} - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{-\cos \alpha} \quad \checkmark$

برای ربع چپ: $\frac{1}{\cos \alpha} - \frac{\sin \alpha}{\cos \alpha} \neq \frac{1 + \sin \alpha}{\cos \alpha} \quad \times$

$$\frac{1 - \sin \alpha}{\cos \alpha}$$

در ربع سف مساوی است $\checkmark$