

(الف) $\tan \frac{11\pi}{4} + \sin \frac{15\pi}{4} \cos \frac{13\pi}{4} = \tan \frac{\pi}{4} + (-\sin \frac{\pi}{4}) (-\cos \frac{\pi}{4})$

$\frac{3\pi}{4} - \frac{\pi}{4}$ $\frac{12\pi}{4} - \frac{\pi}{4}$ $\frac{3\pi}{4} - \frac{\pi}{4}$

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

(ب) $\tan \frac{14\pi}{9} \sin \frac{11\pi}{9} + \cos \frac{10\pi}{9} = \tan \frac{\pi}{9} \times (-\sin \frac{\pi}{9}) - \cos \frac{\pi}{9}$

$\frac{3\pi}{9} - \frac{\pi}{9}$ $\frac{12\pi}{9} - \frac{\pi}{9}$ $\frac{3\pi}{9} + \frac{\pi}{9}$

$\frac{-\sqrt{3}}{3} \times \frac{-\sqrt{3}}{2} - \frac{1}{2} = \frac{3}{6} - \frac{3}{6} = 0$

$\cot n = \frac{\cos n}{\sin n} = 2 \Rightarrow 2 \sin n = \cos n$

$\frac{2 \cos n - \sin n}{\cos n + \sin n} = \frac{2(2 \sin n) - \sin n}{2 \sin n + \sin n} = \frac{3 \sin n}{3 \sin n} = 1$

$\sin \alpha = 2 \cos \alpha \Rightarrow \tan \alpha = 2$

$\cos \alpha = \frac{1}{\sqrt{5}}$ $\cos \alpha = \frac{1}{\sqrt{5}}$

$\cos \left(\frac{11\pi}{4} + \alpha \right) = \cos \frac{11\pi}{4} \cos \alpha - \sin \frac{11\pi}{4} \sin \alpha$

$\frac{3\pi}{4} - \frac{\pi}{4}$ $\frac{3\pi}{4} - \frac{\pi}{4}$

$\cos \alpha = \frac{1}{\sqrt{5}}$ $\sin \alpha = \frac{2}{\sqrt{5}}$

$\frac{-\sqrt{2}}{2} \times \frac{1}{\sqrt{5}} - \frac{\sqrt{2}}{2} \times \frac{2}{\sqrt{5}} = \frac{-\sqrt{2}}{2\sqrt{5}} - \frac{2\sqrt{2}}{2\sqrt{5}} = \frac{-3\sqrt{2}}{2\sqrt{5}}$

$\sin \left(\frac{13\pi}{4} + \alpha \right) = \sin \frac{13\pi}{4} \cos \alpha + \sin \alpha \cos \frac{13\pi}{4}$

$\frac{3\pi}{4} - \frac{\pi}{4}$ $\frac{3\pi}{4} - \frac{\pi}{4}$

$\sin \alpha = \frac{2}{\sqrt{5}}$ $\cos \alpha = \frac{1}{\sqrt{5}}$

$\frac{\sqrt{2}}{2} \times \frac{1}{\sqrt{5}} + \frac{2}{\sqrt{5}} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2\sqrt{5}} + \frac{2\sqrt{2}}{2\sqrt{5}} = \frac{3\sqrt{2}}{2\sqrt{5}}$

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

$1 + \cot^2 n = \frac{1}{\sin^2 n} \Rightarrow 1 + \cot^2 n = 5 \Rightarrow \cot^2 n = 4 \Rightarrow \tan^2 n = \frac{1}{4}$

$$\frac{1}{\sqrt{3}} \times \sqrt{3} \times \sin \alpha = f, \omega \Rightarrow \sqrt{3} \sin \alpha = f, \omega$$

$$\Rightarrow \sin \alpha = \frac{f, \omega}{\sqrt{3}} = \frac{1, \omega}{\sqrt{3}} = \frac{\sqrt{3}}{2\sqrt{3}} = \frac{\sqrt{3}}{2} \Rightarrow \alpha < \begin{matrix} 40^\circ \\ 12^\circ \end{matrix}$$

$$\frac{120}{40} = 3$$

$$2k \times 3k \times \sin 10^\circ = \omega f \Rightarrow k^2 \times \frac{1}{\sqrt{3}} = \omega f \Rightarrow k^2 = 18 \Rightarrow k = 3\sqrt{2}$$

$$\text{مساحت} = 2(2k + 3k) = 2(2 \times 3\sqrt{2} + 3 \times 3\sqrt{2}) = 30\sqrt{2}$$

$$\frac{1}{\sqrt{3}} \times V \times \omega \sin A - \frac{1}{\sqrt{3}} \times V \times f \sin A = 1, V\omega$$

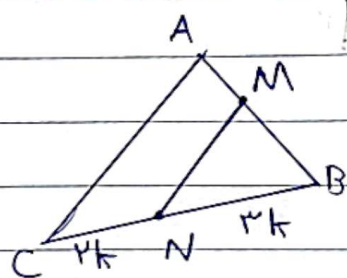
 $S_{\triangle ABC}$
 $S_{\triangle ADE}$

$$\Rightarrow V \sin A (\omega - f) = 1, V\omega$$

$$\Rightarrow \frac{V}{\sqrt{3}} \sin A = \frac{V}{f} \Rightarrow \sin A = \frac{1}{\sqrt{3}}$$

$$\Rightarrow A = \begin{matrix} 30^\circ \checkmark \\ 10^\circ \times \end{matrix} \rightarrow \text{مساحت}$$

$$\tan 30^\circ = \frac{\sqrt{3}}{3}$$



$$2BN = 3NC \Rightarrow BN = 3k$$

$$NC = 2k$$

$$S_{\triangle ABC} = \frac{1}{2} \times AB \times \omega \sin B = 2 \Rightarrow 9MB = \omega AB$$

$$S_{\triangle BMN} = \frac{1}{2} \times MB \times 3k \sin B \Rightarrow MB = 5n$$

$$AB = 9n$$

$$AM = AB - MB = 9n - 5n = 4n$$

$$\frac{BM}{AM} = \frac{5n}{4n} = \frac{5}{4}$$

$$\frac{1}{\sqrt{\cos a}} - \tan a = \frac{1 + \sin a}{|\cos a|} \Rightarrow \frac{1}{|\cos a|} - \frac{1 + \sin a}{|\cos a|} = \frac{\sin a}{\cos a}$$

$$\Rightarrow \frac{-\sin a}{|\cos a|} = \frac{\sin a}{\cos a} \Rightarrow -\sin a \cos a = \sin a |\cos a| \Rightarrow \cos a = |\cos a|$$

= مساحت $\cos a$ ←

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

= مساحت $\sin a$ ←

از آنجایی که $\cos a$ و $\sin a$ منفی هستند پس انتهای کان a در ربع سوم است.