

$$\text{الف) } \tan \frac{11\pi}{6} + \sin \frac{15\pi}{6} \cos \frac{13\pi}{6} = \tan \frac{3\pi}{6} + \sin \frac{7\pi}{6} \cos \frac{5\pi}{6} = \tan \frac{\pi}{2} + \sin \frac{7\pi}{6} \cos \frac{5\pi}{6}$$

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

$$\text{ب) } \tan \frac{13\pi}{6} \sin \frac{11\pi}{6} + \cos \frac{10\pi}{6} = \tan \frac{5\pi}{6} \sin \frac{5\pi}{6} + \cos \frac{5\pi}{6} = \tan \frac{\pi}{6} \sin \frac{\pi}{6} + \cos \frac{\pi}{6} = \frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} = \frac{1}{4} + \frac{\sqrt{3}}{2}$$

$$\cos x = \frac{c}{r} \rightarrow \frac{\cos x}{\sin x} = \frac{r}{c} \rightarrow \cos x = r \sin x$$

$$\frac{r \cos x - \sin x}{\cos x + \sin x} = \frac{12 \sin x - \sin x}{r \sin x + \sin x} = \frac{11 \sin x}{2 \sin x} = \boxed{\frac{11}{2}}$$

$$\sin a = r \cos a, 180^\circ < a < 270^\circ$$

$$\sin^2 a + \cos^2 a = 1 \rightarrow r^2 \cos^2 a + \cos^2 a = 2 \cos^2 a = 1 \rightarrow \cos^2 a = \frac{1}{2}$$

$$\cos a = \pm \frac{1}{\sqrt{2}}$$

$$\text{الف) } \cos \left(\frac{11\pi}{6} + a \right) = \cos \left(\frac{3\pi}{6} + a \right) = \cos \frac{3\pi}{6} \cos a - \sin \frac{3\pi}{6} \sin a =$$

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

$$\text{ب) } \sin \left(\frac{13\pi}{6} + a \right) = \sin \left(\frac{5\pi}{6} + a \right) = \sin \frac{5\pi}{6} \cos a + \sin a \cos \frac{5\pi}{6} =$$

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

$$\left[1 + \tan^2 a = \frac{1}{\cos^2 a} \rightarrow \frac{25}{9} = \frac{1}{\cos^2 a} \rightarrow \cos^2 a = \frac{9}{25}, \sin a = \tan a \times \cos a = \frac{1}{3} \times \frac{3}{5} = \frac{1}{5} = \frac{\sqrt{2}}{10} \right]$$

$$\begin{cases} r \sin^2 x + \cos^2 x = \frac{r}{2} \\ \sin^2 x + \cos^2 x = 1 \end{cases} \Rightarrow r \sin^2 x + \cos^2 x - \sin^2 x - \cos^2 x = \sin^2 x = \frac{1}{r} \rightarrow \cos^2 x = \frac{r}{r+1}$$

$$\tan^2 x = \frac{\sin^2 x}{\cos^2 x} = \frac{\frac{1}{r}}{\frac{r}{r+1}} = \frac{1}{r} = \frac{1}{2} \quad \boxed{1/2}$$

$$\frac{1}{r} \times a \times b \times \sin c = \frac{1}{r} \times 9 \times \sqrt{2} \times \sin a = r \rightarrow \sin a = \frac{r}{r\sqrt{2}} = \frac{1}{\sqrt{2}} \rightarrow a = 45^\circ \text{ or } 135^\circ$$

$$\frac{12}{9} = \boxed{2}$$

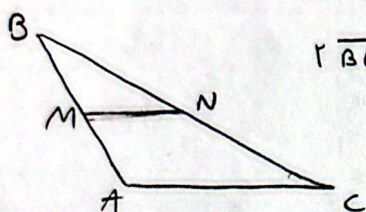
$$a \times b \times \sin_{10} = 2r \rightarrow \frac{r}{r} a^r \times \frac{1}{r} = 2r \rightarrow a^r = \sqrt{r} \rightarrow a = \sqrt{r} \text{ و } b = \sqrt{r}$$

$$\left[\frac{a}{b} = \frac{r}{r} \rightarrow b = \frac{r}{r} a \right]$$

$$P_{\text{متر (الاصول)}} = 2a + 2b = 12\sqrt{r} + 12\sqrt{r} = 24\sqrt{r}$$

$$\left. \begin{aligned} S_{ABC} &= \Delta \times V \times \sin_A \times \frac{1}{r} = \frac{r}{r} \Delta \sin_A \\ S_{ADE} &= r \times V \times \sin_A \times \frac{1}{r} = 1 \Delta \sin_A \end{aligned} \right\} S_{ABC} - S_{ADE} = r \Delta \sin_A = 1, V \Delta \rightarrow \sin_A = \frac{1}{r}$$

$$\tan_{\theta} = \left[\frac{\sqrt{r}}{r} \right] \leftarrow A = r$$



$$r \overline{BN} = r \overline{NC}$$

$$S_{ABC} = r S_{BMN} \rightarrow \frac{1}{r} \times \overline{AB} \times \overline{BC} \times \sin_B = r \times \frac{1}{r} \times \overline{BM} \times \overline{BN} \times \sin_B$$

$$(\overline{BM} + \overline{AM}) \left(\overline{BN} + \overline{NC} \right) = r \overline{BN} \times \overline{BM} \rightarrow r \overline{BM} = \frac{\Delta}{r} (\overline{BM} + \overline{AM})$$

$$r \overline{BM} = \Delta \overline{AM} \rightarrow \frac{BM}{AM} = \left[\frac{\Delta}{r} \right]$$

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

$$\downarrow \quad \frac{1}{|\cos a|} = \frac{\sin a}{\cos a} \xrightarrow{\cos a < 0} \frac{1 + \sin a}{|\cos a|}$$

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

انتهای که a در ناحیه دوم است.