

$$الف) ۲۷^\circ = (x) \text{ rad} \rightarrow \frac{۲۷}{۱۸۰} = \frac{x}{\pi} \Rightarrow x = \frac{۲۷\pi}{۱۸۰} = \frac{۳\pi}{۲}$$

$$ب) ۱۲۵^\circ = (x) \text{ rad} \rightarrow \frac{۱۲۵}{۱۸۰} = \frac{x}{\pi} \Rightarrow x = \frac{۱۲۵\pi}{۱۸۰} = \frac{۲۵\pi}{۳۶}$$

$$ج) \frac{۵\pi}{۱۲} \text{ rad} = (x)^\circ \rightarrow \frac{x}{۱۸۰} = \frac{۵\pi}{۱۲\pi} \Rightarrow x = \frac{۱۸۰ \times ۵}{۱۲} = ۷۵^\circ$$

$$د) \frac{۴\pi}{۹} \text{ rad} = (x)^\circ \rightarrow \frac{x}{۱۸۰} = \frac{۴\pi}{۹\pi} \Rightarrow x = \frac{۴ \times ۱۸۰}{۹} = ۸۰^\circ$$

$$\frac{۱۲۵^\circ}{۹ \times ۲۰۰} = \frac{D_1}{۱۸۰} \rightarrow D_1 = \frac{۱۲۵ \times ۱۸۰}{۹ \times ۲۰۰} = ۱۲,۵^\circ$$

$$\frac{۵\pi}{۸\pi} = \frac{D_2}{۱۸۰} \rightarrow D_2 = \frac{۱۸۰ \times ۵}{۸} = ۱۱,۲۵^\circ$$

$$۱۰a + ۱۲,۵a + ۱۱,۲۵a = ۴۵a = ۱۸۰ \rightarrow a = ۴^\circ$$

$$الف) \cos ۶۰^\circ \cos ۳۰^\circ - \sin ۶۰^\circ \sin ۳۰^\circ - \tan ۶۰^\circ + \cot ۶۰^\circ =$$

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

$$ب) \frac{\tan^2 ۳۰^\circ + \tan^2 ۶۰^\circ + \tan^2 ۴۵^\circ}{\cot ۳۰^\circ - \cot ۴۵^\circ} = \frac{\left(\frac{1}{\sqrt{3}}\right)^2 + (1)^2 + (\sqrt{3})^2}{\sqrt{3} - \frac{\sqrt{3}}{3}} = \frac{\frac{1}{3} + 1 + 3}{\frac{2\sqrt{3}}{3}} = \frac{\frac{13}{3}}{\frac{2\sqrt{3}}{3}} = \frac{13}{2\sqrt{3}}$$

$$-\sin ۳۰^\circ - \cos ۶۰^\circ + \cos ۳۰^\circ \sin ۶۰^\circ = \sin \theta \rightarrow -\frac{1}{2} \times \frac{1}{2} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} = -\frac{1}{4} + \frac{3}{4} = \frac{1}{2} = \sin \theta$$

$$\sin \theta = \frac{\sqrt{3}}{2} \rightarrow \theta = ۶۰^\circ \text{ [چون } \theta < ۹۰^\circ]$$

$$\cos \theta = 1 - \frac{1}{2} = \frac{1}{2} \rightarrow \cos \theta = \frac{1}{2} \Rightarrow \tan \theta = 1$$

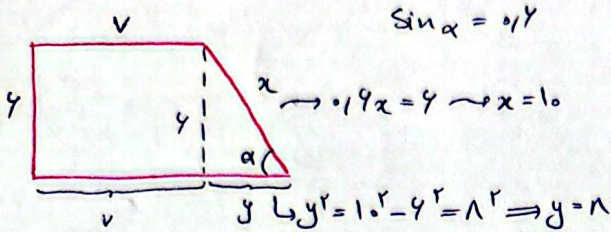
$$\theta = ۴۵^\circ \text{ [چون } \theta < ۹۰^\circ]$$

$$\frac{\tan^2 ۳۰^\circ (1 - \tan^2 ۳۰^\circ)}{(1 - \cot^2 ۳۰^\circ)^2} = \tan \theta \rightarrow \frac{\frac{1}{3} (1 - \frac{1}{3})}{(1 - \frac{1}{3})^2} = \frac{\frac{1}{3} \times \frac{2}{3}}{(1 - \frac{1}{3})^2} = \frac{\frac{2}{9}}{(\frac{2}{3})^2} = \frac{2}{9} \times \frac{9}{4} = \frac{1}{2} = \tan \theta$$

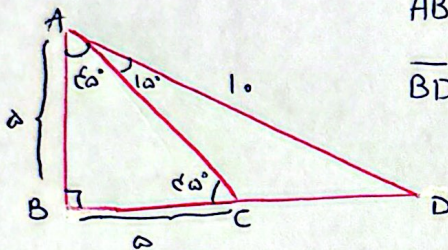
$$\frac{\theta}{۱۸۰} = \frac{\text{Rad}}{\pi} \rightarrow \frac{\pi}{۲}$$

$$\tan \theta = \Delta \rightarrow 1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \rightarrow r^2 = \frac{1}{\cos^2 \theta} \rightarrow \cos \theta = \pm \frac{1}{\sqrt{r^2}}$$

$$\frac{r \sin \theta - \cos \theta}{\sin \theta - r \cos \theta} = \frac{\frac{(\pm \Delta) - (\pm 1)}{\sqrt{r^2}}}{\frac{(\pm \Delta) - (\pm 1)}{\sqrt{r^2}}} = \frac{(\pm \Delta) - (\pm 1)}{(\pm \Delta) - (\pm 1)} \rightarrow \frac{1\Delta - 1}{\Delta - 1} = 1 \quad \frac{-1\Delta + 1}{-\Delta + 1} = 1 \Rightarrow \frac{r \sin \theta - \cos \theta}{\sin \theta - r \cos \theta} = 1$$



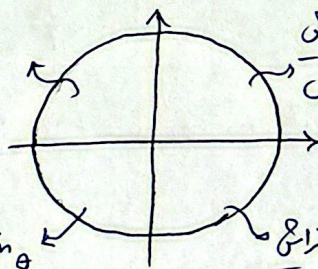
$$P = V + Y + V + A + I = 18$$



$$\overline{AB} = \sin 60^\circ \times 10 = 5 \rightarrow \overline{AB} = \overline{BC} = 5$$

$$\overline{BD} = \sin 30^\circ \times 10 = 5\sqrt{3} \rightarrow \overline{CD} = \overline{BD} - \overline{BC} = 5\sqrt{3} - 5 = 5(\sqrt{3} - 1)$$

$\cos \theta$ كاهش
 $\sin \theta$ كاهش



$\sin \theta$ اقترش
 $\cos \theta$ كاهش

الف اربع سوسم

ب اربع روم

$\sin \theta$ كاهش
 $\cos \theta$ اقترش

$\sin \theta$ اقترش
 $\cos \theta$ اقترش

$$\tan x = \frac{1}{3} \rightarrow 1 + \tan^2 x = \frac{1}{\cos^2 x} \rightarrow \cos^2 x = \frac{9}{10} \rightarrow \cos x = \pm \frac{3}{\sqrt{10}}$$

$$\sin x = \tan x \cos x = \frac{1}{3} \times \frac{-3}{\sqrt{10}} = \frac{-1}{\sqrt{10}}$$