

الف) $۲۷ \times \frac{\pi}{۱۸۰} = \frac{۱۵}{۱۰۰} \pi = \frac{۳\pi}{۲۰} \text{ Rad}$

ب) $۱۲۵ \times \frac{\pi}{۱۸۰} = \frac{۲۵}{۳۶} \pi \text{ Rad}$

ج) $\frac{۵\pi}{۱۲} \times \frac{۱۸۰}{\pi} = ۷۵^\circ$

د) $\frac{۴\pi}{۹} \times \frac{۱۸۰}{\pi} = ۸۰^\circ$

$\frac{۵\pi}{۸} \text{ rad} = ۲۲,۵^\circ$

$\frac{۱۲۵}{۹} \alpha = ۱۲,۵^\circ$

$\Rightarrow ۱۰\alpha + ۲۲,۵\alpha + ۱۲,۵\alpha = ۱۸۰^\circ$
 $۳۵\alpha = ۱۸۰ \Rightarrow \alpha = ۴^\circ$

الف) $\frac{1}{\sqrt{3}} \times \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{3}} - 1 + 2(1) = 1$
 $\frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} - 1 + 2 = 1$

ب) $\frac{\frac{1}{\sqrt{3}} + 1 + \sqrt{3}}{\sqrt{3} - \frac{1}{\sqrt{3}}} = \frac{\frac{1+\sqrt{3}+\sqrt{3}}{\sqrt{3}}}{\frac{\sqrt{3}-1}{\sqrt{3}}} = \frac{1+\sqrt{3}}{\sqrt{3}-1}$

$\sin^2 \theta = -\frac{1}{\sqrt{3}} \times \frac{1}{\sqrt{3}} + \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}$

$\sin^2 \theta = -\frac{1}{3} + \frac{3}{4} = \frac{5}{12} = \frac{1}{2} \Rightarrow \sin \theta = \frac{1}{\sqrt{2}} \Rightarrow \tan \alpha = \frac{\frac{-\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = -1$
 * سینوس و کسینوس هم علامت دارند

$\frac{\tan ۴۰^\circ (1 - \tan^2 ۴۰^\circ)}{(1 - \cot^2 ۴۰^\circ)^2} = \tan \theta \Rightarrow \frac{\frac{\sqrt{3}}{3} (1 - \frac{1}{3})}{(1 - \frac{1}{3})^2} = \frac{\frac{\sqrt{3}}{3} (\frac{2}{3})}{(\frac{2}{3})^2} = \frac{\sqrt{3}}{2}$

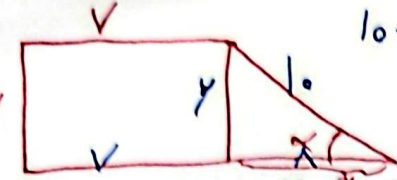
$۹۰ \times \frac{\pi}{۱۸۰} = \frac{\pi}{۲} \text{ Rad}$

$\theta = ۴۰^\circ \Leftarrow \tan \theta = \sqrt{3} \Leftarrow$

$$\frac{\sin \theta}{\cos \theta} = a \Rightarrow \sin \theta = a \cos \theta \Rightarrow 10 \cos \theta - \cos \theta$$

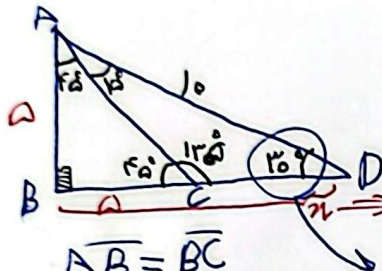
$$\frac{10 \cos \theta - \cos \theta}{\cos \theta} = \frac{10 \cos \theta}{\cos \theta} = 10$$

$10 + r + y + r + 1 = 17$ = مجموع زوايا



$\sin \alpha = \frac{y}{10} \Rightarrow y = 10 \sin \alpha$

$x = \sqrt{10^2 - y^2} = \sqrt{100 - 4r} = 10$



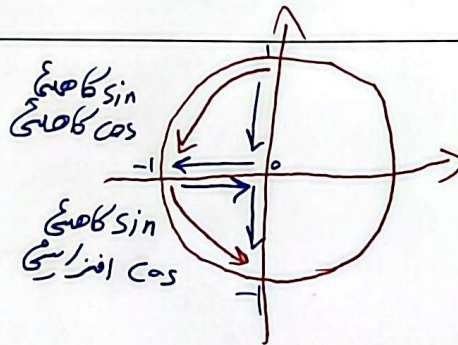
$\cos 100^\circ = \frac{a+x}{10} = \frac{\sqrt{r}}{r} \Rightarrow 10\sqrt{r} = 10 + rx \Rightarrow a\sqrt{r} = a+x$

$\sin 100^\circ = \frac{1}{r} \Rightarrow \frac{1}{r} = a = AB = BC$

$x = \sqrt{r} - a$

$a = 3 \approx 1$

$b = 1 \approx 1$



$\tan x = \frac{1}{r} \Rightarrow \frac{\sin x}{\cos x} = \frac{1}{r} \Rightarrow \cos x = r \sin x$

$\frac{1}{\cos^2 x} = 1 + \tan^2 x$

$\frac{1}{\cos^2 x} = 1 + \frac{1}{a} \Rightarrow \cos^2 x = \frac{a}{1+a} \Rightarrow \sin^2 x + \cos^2 x = 1$

$\frac{\sqrt{10}}{10} \leftarrow \sin(10^\circ) \leftarrow \sin(x) \leftarrow \sin(x) = \frac{1}{10}$