



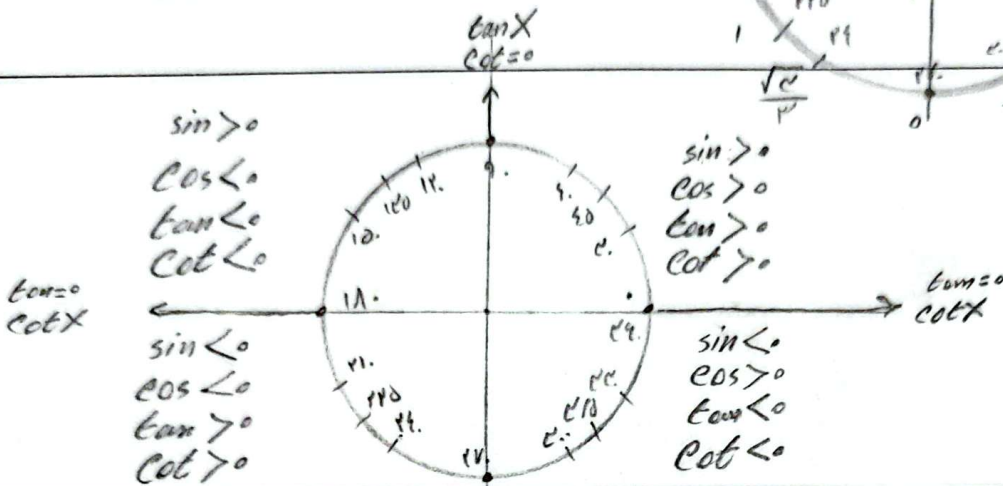
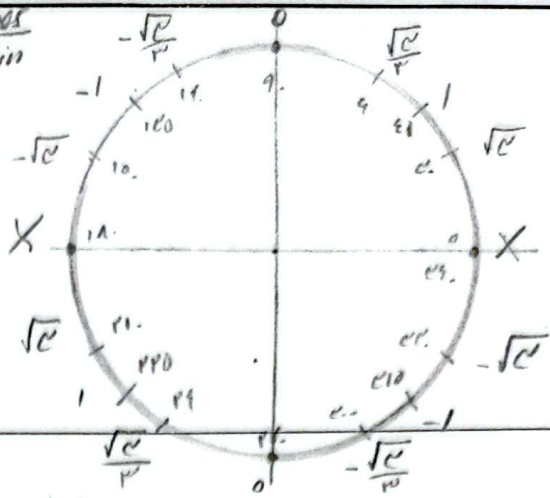
v



5

$\sqrt{r}$ ← with π cot
 $\frac{\sqrt{r}}{r} = \frac{1}{\sqrt{r}}$ ← with $\frac{1}{2}\pi$ cot
 1 ← with $\frac{1}{4}\pi$ cot
 $0, \infty$ ← with 0 cot

$$\cot = \frac{\cos}{\sin}$$



الف) $\sin \pi = \sin 180^\circ \rightarrow \sin 180^\circ = \frac{\sqrt{r}}{r} \rightarrow \boxed{\pi = 4^\circ}$
 ب) $\cos \pi = \cos 180^\circ \rightarrow \cos 180^\circ = -\frac{\sqrt{r}}{r} \rightarrow \boxed{\pi = 180^\circ}$
 ج) $\tan \pi = \tan 180^\circ \rightarrow \tan 180^\circ = -\frac{\sqrt{r}}{r} \rightarrow \boxed{\pi = 180^\circ}$
 د) $\cot \pi = \cot 180^\circ \rightarrow \cot 180^\circ = -1 \rightarrow \boxed{\pi = 180^\circ}$

الف) $-\cos \frac{\pi}{2} = \sin \pi \rightarrow \cos \frac{\pi}{2} = -\frac{1}{r} \rightarrow -\cos \frac{\pi}{2} = \frac{1}{r} = \sin \pi$

$\rightarrow \boxed{\pi = \frac{\pi}{4}, \frac{5\pi}{4}}$

ب) $-\cos \frac{11\pi}{4} = \sin \pi \rightarrow \cos \frac{11\pi}{4} = \frac{\sqrt{r}}{r} \rightarrow -\cos \frac{11\pi}{4} = -\frac{\sqrt{r}}{r} = \sin \pi$

$\rightarrow \boxed{\pi = \frac{7\pi}{4}, \frac{3\pi}{4}}$

الف) $\cot \frac{\pi}{2} = \cos \pi \rightarrow \cot \frac{\pi}{2} = \frac{\cos \frac{\pi}{2}}{\sin \frac{\pi}{2}} = \frac{0}{1} = 0 = \cos \pi$

$\rightarrow \boxed{\pi = 180^\circ}$

ب) $-\cos 180^\circ = \sin \pi \rightarrow \cos 180^\circ = -\frac{\sqrt{r}}{r} \rightarrow -\cos 180^\circ = \frac{\sqrt{r}}{r} = \sin \pi$

$\rightarrow \boxed{\pi = 4^\circ, 180^\circ}$