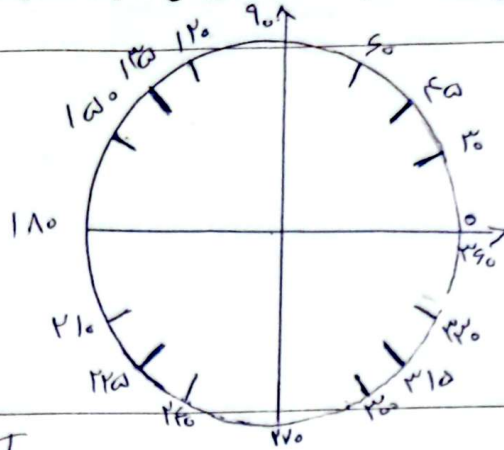
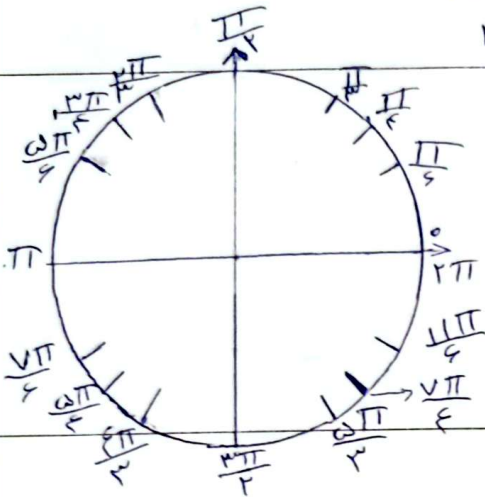




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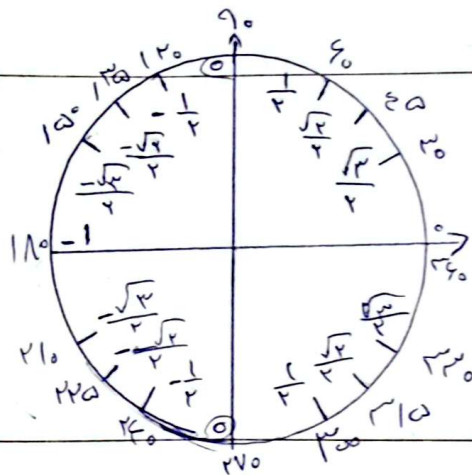


مسئله ۱: همپایه دایره = $2\pi r$

محیط دایره = 2π

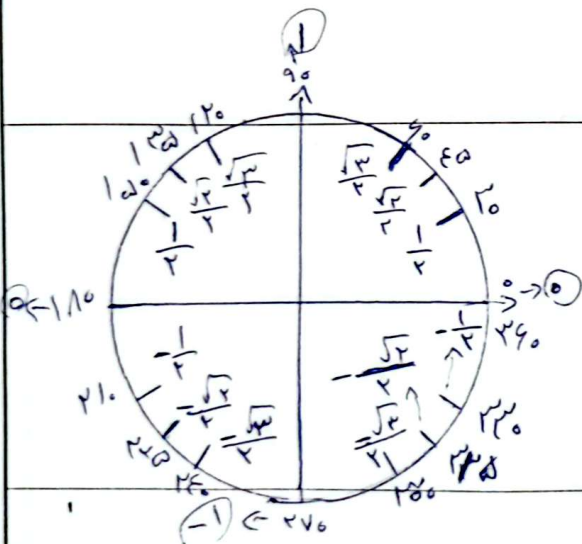
مسئله ۲: برای هر دو دایره و نصف بندی کنیم

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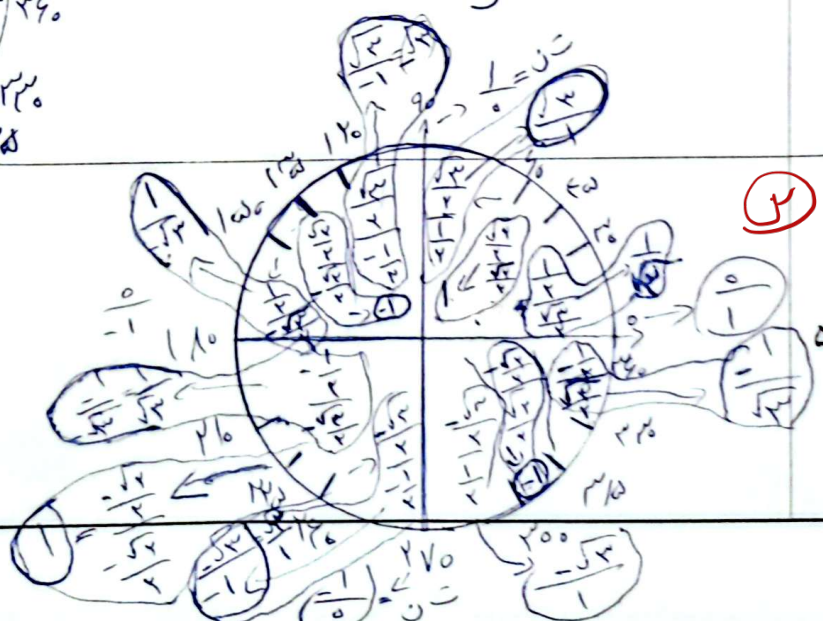
$$\cos = r$$



$$\sin = y$$

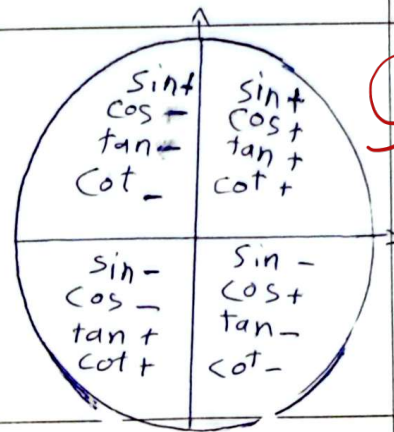
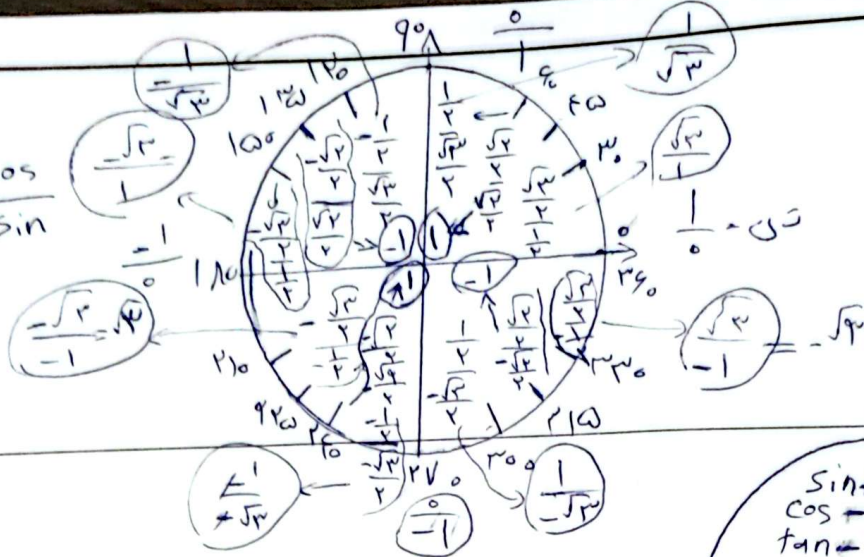
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$$\tan = \frac{\sin}{\cos}$$



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



الف) $\sin 120^\circ = \frac{\sqrt{3}}{2} = \sin 60^\circ = \frac{\sqrt{3}}{2}$

ب) $\cos 150^\circ = -\frac{\sqrt{3}}{2} = \cos 30^\circ = -\frac{\sqrt{3}}{2}$

ج) $\tan 120^\circ = \frac{\sin 120^\circ}{\cos 120^\circ} = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = -\frac{\sqrt{3}}{1} = -\tan 60^\circ$

د) $\cot 120^\circ = \frac{\cos 120^\circ}{\sin 120^\circ} = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}} = -\cot 60^\circ$

هـ) $\cos \frac{2\pi}{3} = -\frac{1}{2} \xrightarrow{\text{قرينة}} \frac{1}{2} \Rightarrow \sin 30^\circ, \sin 150^\circ = \frac{\pi}{6}, \frac{5\pi}{6}$

و) $\cos \frac{4\pi}{3} = -\frac{1}{2} \xrightarrow{\text{قرينة}} \frac{1}{2} \Rightarrow \sin 30^\circ, \sin 150^\circ = \frac{\pi}{6}, \frac{5\pi}{6}$

ز) $\cot \frac{7\pi}{6} = \frac{\cos \frac{7\pi}{6}}{\sin \frac{7\pi}{6}} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \frac{\sqrt{3}}{1} = \cot 60^\circ$

ح) $\cos 150^\circ = -\frac{\sqrt{3}}{2} \xrightarrow{\text{قرينة}} \frac{\sqrt{3}}{2} \Rightarrow \sin 30^\circ, \sin 150^\circ$