أحسب القيم المضبوطة لجيب تمام و جيب الأعداد التالية:

1) $\frac{\pi}{6}$ ، $\frac{-\pi}{6}$ ، $\frac{5\pi}{6}$ ، $\frac{7\pi}{6}$ ، $\frac{-5\pi}{6}$ ، $\frac{-7\pi}{6}$ ، $\frac{4\pi}{3}$.

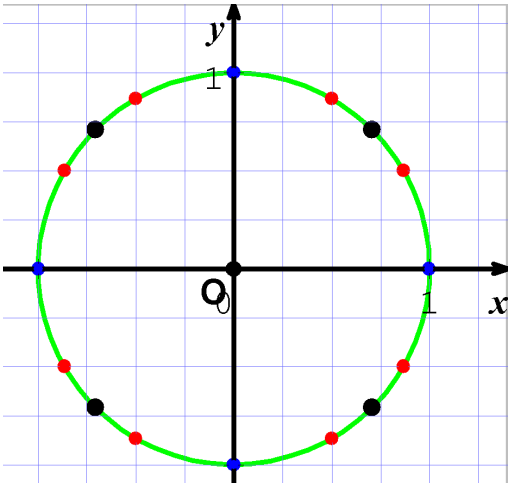
2) 120π ، 213π ، -128π ، -789π .

3) $\frac{193\pi}{3}$ ، $-\frac{193\pi}{3}$ ، $\frac{115\pi}{4}$ ، $-\frac{115\pi}{4}$.

الحل :

1) $\cos\frac{\pi}{6}=\frac{\sqrt{3}}{2}$ ؛ $\cos-\frac{\pi}{6}=\frac{\sqrt{3}}{2}$ ؛ $\sin\frac{\pi}{6}=\frac{1}{2}$ ؛ $\sin-\frac{\pi}{6}=-\frac{1}{2}$.

$\cos\frac{5\pi}{6}=-\frac{\sqrt{3}}{2}$ ؛ $\sin\frac{5\pi}{6}=\frac{1}{2}$ ؛ $\cos\frac{7\pi}{6}=-\frac{\sqrt{3}}{2}$ ؛ $\sin\frac{7\pi}{6}=-\frac{1}{2}$



$\cos\frac{-5\pi}{6}=\cos\frac{5\pi}{6}=-\frac{\sqrt{3}}{2}$ ؛ $\sin\frac{-5\pi}{6}=-\sin\frac{5\pi}{6}=-\frac{1}{2}$

$\cos\frac{-7\pi}{6}=\cos\frac{7\pi}{6}=-\frac{\sqrt{3}}{2}$ ؛ $\sin\frac{-7\pi}{6}=-\sin\frac{7\pi}{6}=\frac{1}{2}$

$\cos\frac{4\pi}{3}=-\frac{1}{2}$ ؛ $\sin\frac{4\pi}{3}=-\frac{\sqrt{3}}{2}$

2) $\cos120\pi=1$ ، $\sin120\pi=0$.

$\cos213\pi=-1$ ، $\sin213\pi=0$.

$\cos-128\pi=1$ ، $\sin-128\pi=0$.

$\cos-789\pi=-1$ ، $\sin-789\pi=0$

3) $\frac{193\pi}{3}=64\pi+\frac{\pi}{3}$ ، ومنه : $\cos\frac{193\pi}{3}=\cos\frac{\pi}{3}=\frac{1}{2}$ و $\sin\frac{193\pi}{3}=\sin\frac{\pi}{3}=\frac{\sqrt{3}}{2}$.

$\cos-\frac{193\pi}{3}=\cos\frac{193\pi}{3}=\frac{1}{2}$ ، $\sin-\frac{193\pi}{3}=-\sin\frac{193\pi}{3}=-\frac{\sqrt{3}}{2}$.

$\frac{115\pi}{4}=28\pi+\frac{3\pi}{4}$ ، ومنه : $\cos\frac{115\pi}{4}=\cos\frac{3\pi}{4}=-\frac{\sqrt{2}}{2}$ و $\sin\frac{115\pi}{4}=\sin\frac{3\pi}{4}=\frac{\sqrt{2}}{2}$.

$\cos-\frac{115\pi}{4}=\cos\frac{115\pi}{4}=-\frac{\sqrt{2}}{2}$ و $\sin-\frac{115\pi}{4}=-\sin\frac{115\pi}{4}=-\frac{\sqrt{2}}{2}$.