

أحسب القيم المضبوطة لجيب تمام و جيب الأعداد التالية:

$$\frac{4\pi}{3}, \frac{-7\pi}{6}, \frac{-5\pi}{6}, \frac{7\pi}{6}, \frac{5\pi}{6}, \frac{-\pi}{6}, \frac{\pi}{6} \quad (1)$$

$$-789\pi, -128\pi, 213\pi, 120\pi \quad (2)$$

$$-\frac{115\pi}{4}, \frac{115\pi}{4}, -\frac{193\pi}{3}, \frac{193\pi}{3} \quad (3)$$

الحل:

$$\sin -\frac{\pi}{6} = -\frac{1}{2}, \sin \frac{\pi}{6} = \frac{1}{2}, \cos -\frac{\pi}{6} = \frac{\sqrt{3}}{2}, \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2} \quad (1)$$

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

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

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

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

$$\sin 120\pi = 0, \cos 120\pi = 1 \quad (2)$$

$$\sin 213\pi = 0, \cos 213\pi = -1$$

$$\sin -128\pi = 0, \cos -128\pi = 1$$

$$\sin -789\pi = 0, \cos -789\pi = -1$$

$$\sin \frac{193\pi}{3} = \sin \frac{\pi}{3} = \frac{\sqrt{3}}{2}, \cos \frac{193\pi}{3} = \cos \frac{\pi}{3} = \frac{1}{2} \text{ ، ومنه : } \frac{193\pi}{3} = 64\pi + \frac{\pi}{3} \quad (3)$$

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

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

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

