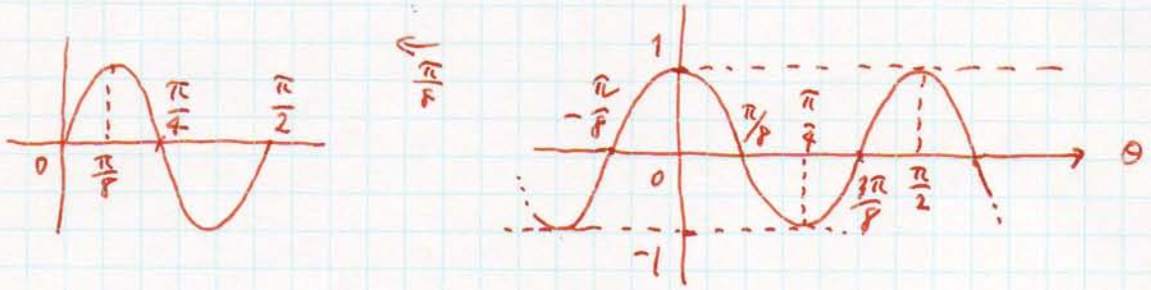
7/5 解析入門.

問1. $f(\theta) = \sin(4\theta + \frac{\pi}{2})$ のグラフをかけ

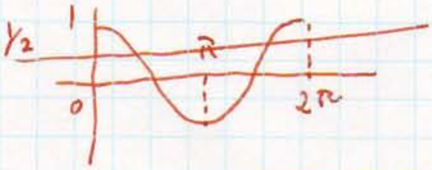
$$\sin\theta \to \sin 4\theta \to \sin 4(\theta + \frac{\pi}{8}) = \sin(4\theta + \frac{\pi}{2})$$

$\sin 4\theta = \sin \frac{\theta}{1/4}$ （θ方向に $-\frac{\pi}{8}$ 平行移動）

（θ方向に $\frac{1}{4}$ 倍）



問2. $\begin{cases} \cos\theta > \frac{1}{2} \\ 0 \leqq \theta \leqq 2\pi \end{cases}$ を解け.



$\cos\theta = \frac{1}{2} \Rightarrow \theta = \frac{\pi}{3}, \frac{5}{3}\pi$

$\therefore 0 \leqq \theta < \frac{\pi}{3}$ または $\frac{5}{3}\pi < \theta \leqq 2\pi$

問. (1) $\sin \frac{7}{12}\pi$ を求めよ.

$$\sin \frac{7}{12}\pi = \sin(\frac{3}{12}\pi + \frac{4}{12}\pi) = \sin\frac{\pi}{4}\cos\frac{\pi}{3} + \cos\frac{\pi}{4}\sin\frac{\pi}{3} = \frac{1}{\sqrt{2}} \cdot \frac{1}{2} + \frac{1}{\sqrt{2}} + \frac{\sqrt{3}}{2}$$

$$= \frac{1+\sqrt{3}}{2\sqrt{2}} = \frac{\sqrt{6}+\sqrt{2}}{4}$$

(2) $\cos\frac{5}{8}\pi$ を求めよ.

半角の公式から $\cos^2\frac{5}{8}\pi = \frac{1 + \cos\frac{5}{4}\pi}{2} = \frac{1 - \frac{1}{\sqrt{2}}}{2} = \frac{2-\sqrt{2}}{4}$

$\therefore \cos\frac{5}{8}\pi = \pm\sqrt{\frac{2-\sqrt{2}}{4}}$

$\frac{\pi}{2} < \frac{5}{8}\pi < \frac{3}{2}\pi$ だから $\cos\frac{5}{8}\pi < 0$.

$\therefore \cos\frac{5}{8}\pi = -\frac{\sqrt{2-\sqrt{2}}}{2}$