Part I Problems

**Problem 1:** Find the smallest period for each of the following:

a) $\sin \frac{\pi t}{3}$

b) $|\sin t|$

c) $\cos^2 3t$

**Problem 2:**

Find the Fourier series of the function $f(t)$ of period $2\pi$ which is given over the interval $-\pi < t \leq \pi$ by

$$f(t) = \begin{cases} 0, & -\pi < t \leq 0 \\ 1, & 0 < t \leq \pi \end{cases}$$