EE3210 Signals and Systems

Tutorial 3

Problem 1: Determine whether or not each of the following continuous-time signals is periodic. If the signal is periodic, determine its fundamental period.

(a) $x(t) = 3\cos(4t + \frac{\pi}{3})$

(b) $x(t) = e^{j(\pi t - 1)}$

(c) $x(t) = [\cos(2t - \frac{\pi}{3})]^2$

(d) $x(t) = \mathcal{E}\{\cos(4\pi t)u(t)\}$

(e) $x(t) = \mathcal{E}\{\sin(4\pi t)u(t)\}$

Problem 2: Determine whether or not each of the following discrete-time signals is periodic. If the signal is periodic, determine its fundamental period.

(a) $x[n] = \sin(\frac{6\pi}{7}n + 1)$

(b) $x[n] = \cos(\frac{1}{8}n - \pi)$

(c) $x[n] = \cos(\frac{\pi}{8}n^2)$

(d) $x[n] = \cos(\frac{\pi}{2}n)\cos(\frac{\pi}{4}n)$

(e) $x[n] = 2\cos(\frac{\pi}{4}n) + \sin(\frac{\pi}{8}n) - 2\cos(\frac{\pi}{2}n + \frac{\pi}{6})$