This Month 1 2 3 4 5 6 7 8 9 10 11 12 Date ☐Mon ☐Tue ☐Wed ☐Thu ☐Fri ☐Sat ☐Sun

problem 1

(a) $\mu_X(n) = E(X_n) = E\left[2\cos\left(\frac{\pi}{\delta}n + \phi\right)\right] = \int_0^{2\pi} 2\cos\left(\frac{\pi}{\delta}n + \phi\right)\frac{1}{2\pi}d\phi$

$= 0$

(b) $R_X(m,n) = E\left[4\cos\left(\frac{m}{\delta}\pi + \phi\right)\cos\left(\frac{n}{\delta}\pi + \phi\right)\right]$

$= 2\cos\left(\frac{(m-n)}{\delta}\pi\right)$

(c) $\mu_X(n) = \mu_X$, $R_X(m,n) = R_X(m-n)$ → Yes

problem 2

(a) $\mu_X(t) = E[A\cos(wt+\theta)] = \frac{1}{2\pi}\int_0^{2\pi} A\cos(wt+\theta) = 0$

(b) $R_X(t_1,t_2) = A^2 E(\cos(wt_1+\theta)\cos(wt_2+\theta))$

$= \frac{A^2}{2\pi}\int_0^{2\pi} \frac{\cos(w(t_1-t_2)) + \cos(w(t_1+t_2)+\theta)}{2} d\theta$

$= \frac{A^2}{2}\cos(w(t_1-t_2))$

(c) (a), (b) 둘 다 만족하므로 WSS proved