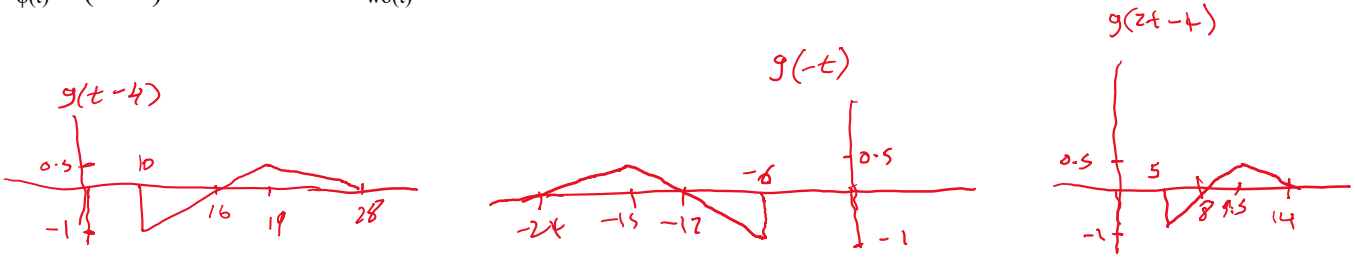
ENGR 4323/5323: Digital and Analog Communication

HW 1_Ch2

1) $E_x = 3$

2) $P_{\varphi(t)} = (1-e^{-\pi})/\pi$ $P_{wo(t)} = 1$

3)



4) c = ½ e(t) = (t – 0.5) so $E_g = 1/12$

5) $\rho = 0.95$

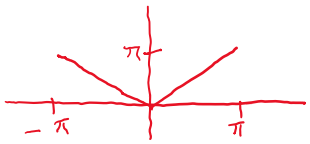
6) $\rho_1 = 0$ $\rho_2 = -1$ $\rho_3 = 0$ $\rho_4 = 2.83/\pi$

7) a $U_1(t) = 1 \quad 0<t<1$ $U_2(t) = 2\sqrt{3}(t-0.5) \quad 0<t<1$

b) $g(t) = 0.5U_1(t) + \frac{1}{2\sqrt{3}}U_2(t)$ $\vec{g} = [0.5, \frac{1}{2\sqrt{3}}]$ $x(t) = 1\,U_1(t) + 0\,U_2(t)$ $\vec{x} = [1, 0]$

8)

a)



$D_0 = \frac{\pi}{2}$ $D_n = \frac{1}{\pi n^2}\left[\pi n \sin(n\pi) + \cos(n\pi) - 1\right]$

b) $P_g = \frac{\pi^2}{3} \Rightarrow P_g = D_0^2 + \sum_{n=1}^{\infty} 2|D_n|^2$