(1)

a $p(X\ x_2$ $p(X_1$ $p(X_2)$ Note $p($ $\int p(x$ dx f $\parallel$

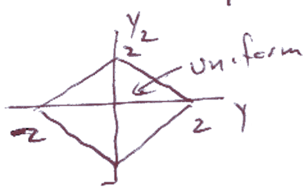
$p(x_2$ $\int p(X_1 x_2) dx_2$ $+$ for all x

4 **Note:** This is Hadamard transform

$\Rightarrow p(x_1) p(x_2)$ $p($ x_2 for x_2

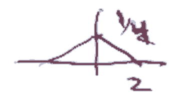
b $p(Y_1 Y_2$ $Y_1 Y_2$ $\underbrace{f_X \quad Y_1+Y_2 \quad Y_2}_{\frac{1}{4}}$ $\underbrace{J}$ $\frac{1}{8}$ for all y

c



$p(Y_1$

$p(Y_2$



$p(X_1) * p($ since X_2 independ and Y_1 X_1+X

$p(X_1)$ $p(X$

A Y_1 Y_2 independent

$p(Y_1$ $p(Y_1) p($ 2

$\Rightarrow$ ck point fc

6 p Y Y_1 $p(Y$ $) p(Y_2$

$\frac{1}{8} \neq \frac{1}{4}$

(2) ϕ_{xx} $t\ \tau)$ $E\{[A g(t) \cos \pi f_1 t + B g(t) \cos(2\pi f\ t\ ]$

$[A g(t+\tau$ $\cos($ $f_1(t+\tau$ $+B g(t+\tau)\cos($ $f_2\ t+$ $)]\}$

$E[AB]\ g($ $g($ $\tau)\cos 2\pi f_1 t \cos 2\pi f_2 (t+\tau$

$E[BA]$ $(t$ $g(t\ \tau$ $\cos 2\pi f_2 t \cos$ f $t+$

$+E[\ ^2]\ g(t)\ g($ $\tau) \cos 2\pi f\ t$ $(2\pi f_1(t$ $)$

$E[B^2]$ $g(\ )g($ $\cos 2\pi f_2 t$ $2\pi f_2$ $t+$

depends t,τ

simplify If A B independent $(4\pi f_1 t + 2\pi f_1 \tau$

$\phi_{xx}\ t,$ $E[A^2]\ g(t) g(t+\tau)[\cos$ ~~$4\pi f_1$~~ $+\cos 2\pi f\ \tau$ $f\ \tau]$

$\frac{1}{2} E[B^2]$ $g(t$ $g(t+\tau$ $[\cos(4\pi f\ t$ $2\pi f_2 \tau)$

(1) note $g(t$ $g(t$ $)$ for τ T $\tau\ T$

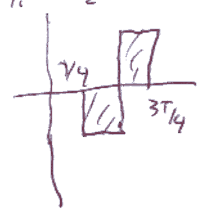
ϵ $t) g(t$

(2) $\Rightarrow$ still $\dim$ f t but periodic in t

a) $\int_{T/4}^{3T/4} \psi_1 \; t \Rightarrow B \; \sqrt{2}$

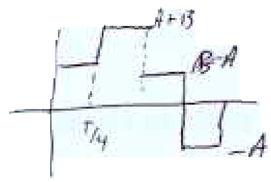
$T \quad \psi \; (t)\,dt \Rightarrow A \; \sqrt{\frac{1}{T}}$

b) $\int^{T} \psi_1(t)\,\psi_2(t \quad 0$



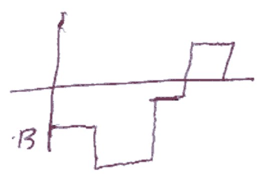
a

$S_1 \qquad \psi_1(t + \psi_2(t$



$S \; (t) \qquad \psi_1(t \qquad \psi_2(t)$

$S_1(t$



~~I $x(t)$ is stationary~~

$A \qquad B$