Fourier Transform > signal. fin en fransform freg

P. Transform

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F  $f(y) = \int f(u) e^{-ixu} du$ f(u) -> f(1) -> Day  $f(A) \rightarrow f(x) \rightarrow night$ shift  $f(x) \rightarrow f(x)$   $f(x) = \frac{1}{24} f(x) e^{-\frac{1}{24}x} dx$ fot f(u) -> f(d) f(1) = f(u) e du FCT f(u) -> fc(1) SET fc(1) = f(u) Cos 1u du (Even) f(x) = 2 f(x) f(x) = 2 f(x) (0) (0) (0) (0) $f_s(A) \rightarrow f(x)$ FST f(u) > Fs(1) f(x) = iffs(1) Sin1xdx del fs(1) = ff(u) sin Audu (odd)odd function Pre- Requisites Even function 1) f(-x) = -f(x) Sin0=0 (050=1 1) f(-x)= f(x) 2)  $Sin, x, x^3$ Sin1/2=1 Cos1/2=0 2) Cos, x2, 1x1, K 3) FOT) FST Sin 1 = 0 Cos 1 = -1 Sin # = 0 Cos 21 = 1 3) FCT  $e^0 = 1$ ,  $e^\infty = 0$ ,  $e^\infty = \infty$ u)  $\int_{-\alpha}^{\alpha} f(x) dx = \begin{cases} 0 & \text{when } f(x) \text{ is odd} \\ 2 \int_{-\alpha}^{\alpha} f(x) dx & \text{when } f(x) \text{ is even} \end{cases}$ 

I' 
$$\int \sin u \, du = -\frac{\cos u}{1}$$

$$\int \cos u \, du = \frac{\sin u}{1}$$

$$\int e^{i} du = \frac{-i du}{1}$$

$$\int \frac{d}{dx} x^{2} \Rightarrow nx^{n-1}$$

 $\int u \, v \, dx = u \, v_1 - u \, v_2 + u'' \, v_3 - \dots$   $\int u \, sin \, u \, du = \left[ u \left( -\frac{\cos u}{1} \right) - 1 \left( -\frac{\sin u}{1^2} \right) \right] \, do$   $\int e^{au} \, sin \, bu \, du = \frac{e^a}{1^2 + b^2} \left( a \, sin \, bu - b \, cos \, bu \right)$ 

 $\int_{e}^{au} \cos bu du = \frac{e^{au}}{a^2 + b^2} \left( a \cos bu + b \sin bu \right)$