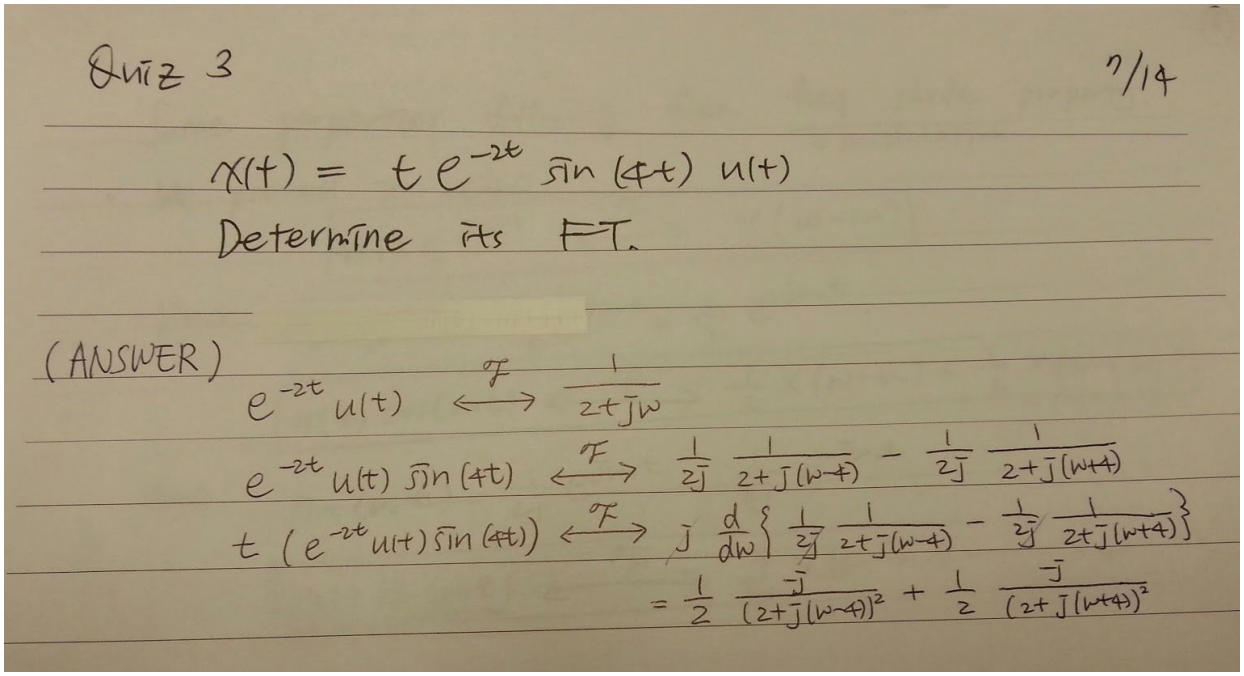
ECE 301 Quiz 3.

7/14 (Tue)

x(t) = t e^(-2t) sin(4t) u(t)
Determine its Fourier Transform.



Quiz 3 7/14

$x(t) = t e^{-2t} \sin(4t)\, u(t)$

Determine its FT.

(ANSWER)

$$e^{-2t} u(t) \xleftrightarrow{\mathcal{F}} \frac{1}{2+jw}$$

$$e^{-2t} u(t) \sin(4t) \xleftrightarrow{\mathcal{F}} \frac{1}{2j}\frac{1}{2+j(w-4)} - \frac{1}{2j}\frac{1}{2+j(w+4)}$$

$$t\left(e^{-2t} u(t) \sin(4t)\right) \xleftrightarrow{\mathcal{F}} j\frac{d}{dw}\left\{\frac{1}{2j}\frac{1}{2+j(w-4)} - \frac{1}{2j}\frac{1}{2+j(w+4)}\right\}$$

$$= \frac{1}{2}\frac{-j}{(2+j(w-4))^2} + \frac{1}{2}\frac{-j}{(2+j(w+4))^2}$$