频域微分积分特性例1

例1 $f(t)=t\varepsilon(t)\longleftrightarrow F(\mathrm{j}\omega)=?$

解: $\varepsilon(t)\longleftrightarrow \pi\delta(\omega)+\dfrac{1}{j\omega}$ $\qquad (-\mathrm{j}t)^n f(t)\longleftrightarrow F^{(n)}(\mathrm{j}\omega)$

$$-jt\,\varepsilon(t)\longleftrightarrow \frac{\mathrm{d}}{\mathrm{d}\omega}\left[\pi\delta(\omega)+\frac{1}{j\omega}\right]$$

$$t\varepsilon(t)\longleftrightarrow j\pi\delta'(\omega)-\frac{1}{\omega^2}$$

注意: $t\varepsilon(t)=\varepsilon(t)*\varepsilon(t)\longleftrightarrow \left[\pi\delta(\omega)+\dfrac{1}{j\omega}\right]\times\left[\pi\delta(\omega)+\dfrac{1}{j\omega}\right]$

It's wrong.

Because δ(ω)δ(ω) and (1/jω)δ(ω) is not defined.