

2.1 Evaluate

$$(a) \int_{-\infty}^{\infty} \delta(-3t)(1 + \cos^2 \pi t) dt$$

$$(b) \int_{-\infty}^{\infty} \delta(t - \frac{1}{2}) \frac{t^2}{(t^2 + 7)} dt$$

$$(c) \int_4^7 \delta(t-2) f(t) dt$$

$$(d) \text{Plot } G(t) = \int_{-\infty}^t [\delta(x+1) - \delta(x-1)] dx$$

2.2

(a) If $y = ax + b$, is y a linear function of x ?

(b) If $y = L[x(t)]$ and $L[\delta(t)] = h(t) = \delta(t)$, what is $y(t)$?

2.3 If the system response to a δ is $h(t)$, what is the response to an input of $e^{2\pi i \nu_0 t}$?