2E2 Tutorial Sheet 5 First Term[1]

9 November 2003

1. (2) Find the convolution $(f * g)(t)$ when $f(t) = t$, $g(t) = e^{2t}$ $(t \geq 0)$.

2. (2) Use the convolution theorem to find the function $f(t)$ with

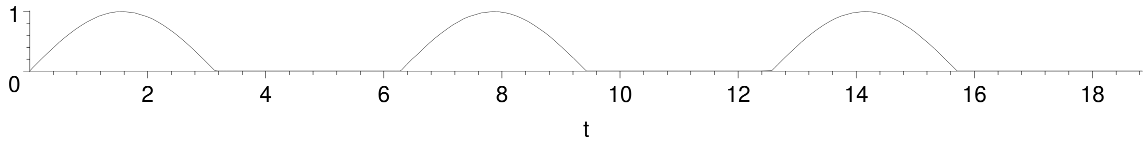
$$\mathcal{L}(f) = \frac{1}{s^2(s-4)}. \tag{1}$$

3. (4) Use the formula for the Laplace transform of a periodic function with period c:

$$\mathcal{L}(f) = \frac{1}{1-e^{-cs}} \int_0^c f(t) e^{-st} dt \tag{2}$$

to find the Laplace transform of a half-rectified wave

$$f(t) = \begin{cases} \sin t & \sin t > 0 \\ 0 & \sin t \leq 0 \end{cases} \tag{3}$$



This is the form a AC current has after going through a diode.

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