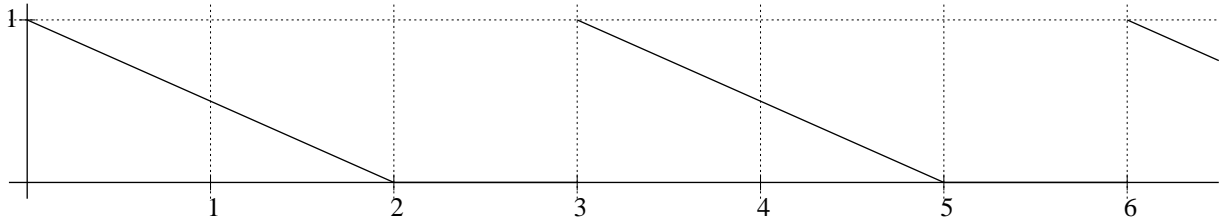


Sections: 7.7, 7.8

1. Compute the Laplace transform of the periodic function $f(t)$ given by the graph below.



2. Let $f(t) = e^t$, $0 < t < 1$ and extend periodically to a function defined on the positive reals. Apply the Laplace transform and solve for $Y(s)$ in the initial value problem

$$y'' - y = f(t), \quad y(0) = y'(0) = 0.$$

3. Compute the convolution $f(t) * g(t)$ for the following:

(a) $f(t) = 1, g(t) = t^2$;

(b) $f(t) = t, g(t) = t$;

(c) $f(t) = 1 * 1, g(t) = t$;

(d) $f(t) = t, g(t) = e^t$.

4. Verify that $\mathcal{L}\{f * g\}(s) = F(s)G(s)$ for cases (a) and (d) from the preceding problem.