

Problem 40

Consider the function p defined by

$$p(t) = \begin{cases} t, & 0 \leq t < 1, \\ 2 - t, & 1 \leq t < 2; \end{cases} \quad p(t+2) = p(t).$$

- (a) Sketch the graph of $y = p(t)$.
- (b) Find $\mathcal{L}\{p(t)\}$ by noting that p is the periodic extension of the function h in Problem 39(c) and then using the result of Problem 34.
- (c) Find $\mathcal{L}\{p(t)\}$ by noting that

$$p(t) = \int_0^t f(t) dt,$$

where f is the function in Problem 36, and then using Theorem 6.2.1.