Problem B–2–1

Derive the Laplace transform of the function

$$\begin{aligned} f(t) &= 0 && t < 0 \\ &= te^{-2t} && t \geq 0 \end{aligned}$$

Problem B–2–2

Find the Laplace transforms of the following functions:

(a)
$$\begin{aligned} f_1(t) &= 0 && t < 0 \\ &= 3\sin(5t + 45°) && t \geq 0 \end{aligned}$$

(b)
$$\begin{aligned} f_2(t) &= 0 && t < 0 \\ &= 0.03(1 - \cos 2t) && t \geq 0 \end{aligned}$$

Problem B–2–5

What is the Laplace transform of the function $f(t)$ shown in Figure 2–13?

Problem B–2–6

Obtain the Laplace transform of the pulse function $f(t)$ shown in Figure 2–14.

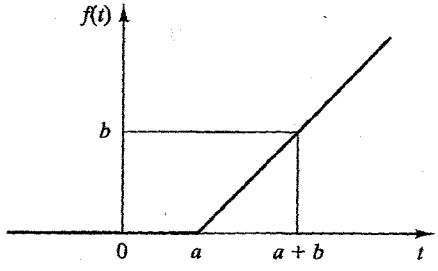

Figure 2–13 Function $f(t)$.

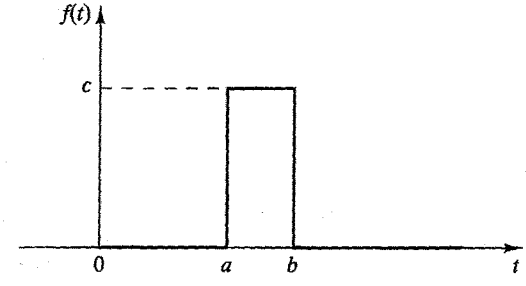

Figure 2–14 Pulse function.

Problem B–2–13

What are the inverse Laplace transforms of the following functions?

(a)
$$F_1(s) = \frac{s + 5}{(s + 1)(s + 3)}$$

(b)
$$F_2(s) = \frac{3(s + 4)}{s(s + 1)(s + 2)}$$
