

**Problem 29**

Suppose that  $f$  and  $f'$  are continuous for  $t \geq 0$  and of exponential order as  $t \rightarrow \infty$ . Use integration by parts to show that if  $F(s) = \mathcal{L}\{f(t)\}$ , then  $\lim_{s \rightarrow \infty} F(s) = 0$ . The result is actually true under less restrictive conditions, such as those of Theorem 6.1.2.