CAPÍTULO

6

La transformada de Laplace

6.4.1 Cambio de escala

$$\mathfrak{L}\{f(at)\} \longleftrightarrow \frac{1}{a}F\left(\frac{s}{a}\right), \text{ con } a > 0. \tag{6.1}$$

▼ Si $a > 0$:

$$\mathfrak{L}\{f(at)\} = \int_0^\infty e^{-st} f(at)\,dt = \int_0^\infty e^{-s\frac{u}{a}} f(u)\,\frac{du}{a} = \frac{1}{a}\int_0^\infty e^{-\frac{s}{a}u} f(u)\,du = \frac{1}{a}F\left(\frac{s}{a}\right).$$

Hemos usado:

$$\begin{cases} u = at \;\Rightarrow\; du = a\,dt; \\ t = \dfrac{u}{a} \;\Rightarrow\; dt = \dfrac{du}{a}. \end{cases}$$

□

1. canek.azc.uam.mx: 24/ 9/ 2010