$$= \int_0^\infty f(v)\, e^{-sv} e^{-sa}\, dv$$

$$= e^{-sa} \int_0^\infty e^{-sv} f(v)\, dv = e^{-sa} F(s). \ \square$$

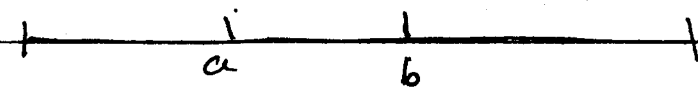
<u>Corollary.</u> Let $h(t) = g(t+a)$. Then

$$\mathcal{L}\{h(t-a)\, u(t-a)\} = \mathcal{L}\{g(t)\, u(t-a)\}$$
$$= e^{-as}\, \mathcal{L}\{h(t)\}$$
$$= e^{-as}\, \mathcal{L}\{g(t+a)\}$$

$$\boxed{\mathcal{L}\{g(t)\, u(t-a)\} = e^{-as}\, \mathcal{L}\{g(t+a)\}}$$

Let $0 \le a < b$.

$u(t-a) = H(t-a)$	0	1	1
$u(t-b) = H(t-b)$	0	0	1



$$u(t-a) - u(t-b) = H(t-a) - H(t-b) = \begin{cases} 1 & \text{if } a < t < b \\ 0 & \text{otherwise} \end{cases}$$

<u>Example</u>