$$\tilde{f}(t) = \begin{cases} f(t-a) & t \geq a \\ 0 & t < a \end{cases}$$

$(a > 0)$

$$\Rightarrow \tilde{F}(s) = \int_0^\infty e^{-st} \tilde{f}(t)\, dt$$

$$= \int_a^\infty e^{-st} f(t-a)\, dt$$

$$\overset{\tilde{t} = t-a}{=} \int_0^\infty e^{-s(\tilde{t}+a)} f(\tilde{t})\, d\tilde{t}$$

$$= e^{-sa} F(s)$$