7.3.42.

$$L\{\sin t U(t - \frac{\pi}{2})\}$$

$$f(t) = \sin t U(t - \frac{\pi}{2}) =$$

$$u = t - \frac{\pi}{2}, \qquad \sin t = \sin(u + \frac{\pi}{2}) =$$

$$= \qquad \qquad =$$

$$= \sin u \cos\frac{\pi}{2} + \sin\frac{\pi}{2} \cos u = \cos u = \cos(t - \frac{\pi}{2})$$

$$= \cos(t - \frac{\pi}{2})U(t - \frac{\pi}{2})$$

$$L\{f(t)\} = L\{\cos(t - \frac{\pi}{2})\,U(t - \frac{\pi}{2})\} =$$

$$= \left\{ L\{g(t-a)U(t-a)\} = e^{-sa}L\{g(t)\} \right\} =$$

$$= e^{-s\frac{\pi}{2}}L\{\cos t\} = e^{-s\frac{\pi}{2}}\frac{s}{s^2 + 1}$$