[mex21] Gauge invariance of Lagrange equations

A dynamical system with n degrees of freedom is specified by some Lagrangian $L(q_1, \ldots, q_n, \dot{q}_1, \ldots, \dot{q}_n, t)$. Show by direct substitution that the Lagrangian

$$L' = L + \frac{d}{dt} F(q_1, \ldots, q_n, t)$$

yields the same Lagrange equations if F is an arbitrary differentiable function of its arguments.

Solution: