[mex172] Parabolic slide on rotating Earth

A bead of mass m slides without friction along a wire of parabolic shape, $z = Ay^2$, in a uniform gravitational field g pointing in the negative z-direction. In generalization to [mex131], the effect of the Earth's rotation rotation must be taken into account under the assumption that the slide is placed at latitude λ with its (vertical) plane oriented perpendicular to the meridian.
(a) Construct the Lagrangian $L(y, \dot{y})$.
(b) Derive the Lagrange equation.

Solution: