[mex35] Noether's theorem I: translation in space

Consider the Lagrangian $L = \frac{1}{2}m\left(\dot{x}^2 + \dot{y}^2 + \dot{z}^2\right) - V(y,z)$ of a particle with mass m moving in 3D space under the influence of a scalar potential.
(a) Identify an infinitesimal symmetry transformation.
(b) Apply Noether's theorem to determine the associated constant of the motion.

Solution: