[mex39] Pendulum oscillations in rotating plane

A particle of mass \( m \) is constrained (without friction) to move on a circular path of radius \( R \) which rotates about its vertical diameter with constant angular velocity \( \Omega \) of the particle. (a) Determine the stable equilibrium position \( \phi_0(\Omega, g, R) \). (b) Determine the angular frequency \( \omega(\Omega, g, R) \) of small oscillations of the particle about the stable equilibrium position.

Solution: