

$$x^2 + y^2 = 1$$

$$x\dot{x} + y\dot{y} = 0$$

$$\dot{x}^2 + x\ddot{x} + \dot{y}^2 + y\ddot{y} = 0$$

$$\ddot{x} = Fx$$

$$\ddot{y} = Fy - 9.81$$