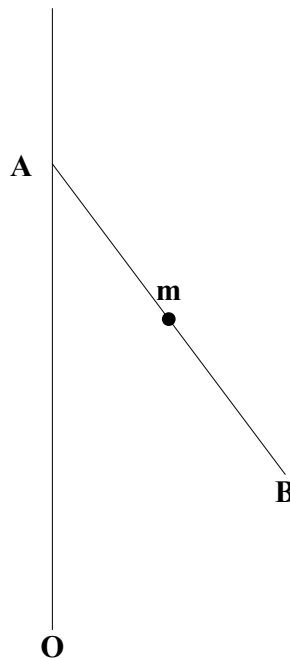


PHYS 314

HOMEWORK #9

Due : 12 April 2017

1. AB is a straight frictionless wire fixed at point A on a vertical axis OA such that AB rotates around OA at a constant angular velocity ω . A bead of mass m is constrained to move along this wire. Set up the Lagrangian, write Lagrange's equations, and determine the motion of m at any time.



2. A bead slides without friction on a wire in the shape of a cycloid, which can be parameterized as :

$$x = a(\theta - \sin\theta) \quad y = a(1 + \cos\theta)$$

where a is a constant. Find the Lagrangian for the system and write Lagrange's equations.