

Notes

Something

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Caprice

1 Fall 2018

This is my note for some non-trivial but not systematic problems which involves some interesting physics or maths.

PART

I

| Section 1. Fall 2018

1.1 Walkway equilibrium

Suppose the mass of the objects attached to each end of the rope are m_1 and m_2 , The angles between each segment of the rope, bended by the central object which has mass M , with the horizontal plane are θ and ϕ . The distance between two pulleys is L , and what we want to know is the vertical displacement d of the central object. Thus we can obtained the equations for d when the system is at equilibrium.

$$L = d(\cot \theta + \cot \phi), \quad (1.1)$$

$$m_1 g \cos \theta = m_2 g \cos \phi, \quad (1.2)$$

$$m_1 g \sin \theta + m_2 g \sin \phi = Mg, \quad (1.3)$$