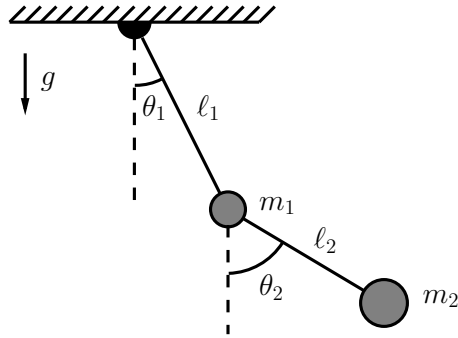


**Q1.** The trajectories of the frictionless double pendulum are the extremals of the functional

$$J = \int_{t_0}^{t_f} L(\theta_1(t), \theta_2(t), \dot{\theta}_1(t), \dot{\theta}_2(t)) dt$$

where  $L = \text{KE} - \text{PE}$ , the difference between kinetic and gravitational potential energy. Obtain the dynamics of the system.



**Q2.** Problem 4-4.

**Q3.** Problem 4-5.

**Q4.** Problem 4-8.

**Q5.** Problem 4-9.

**Q6.** Problem 4-11.

**Q7.** Problem 4-12.