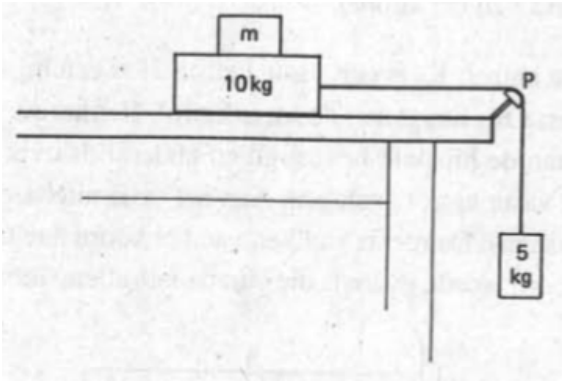
Tutorial 6



Problem 1. A block of mass M=10 kg lies on a horizontal table, and is connected through a massless cord with a hanging object whose mass is equal to 5 kg. The cord moves through a frictionless and massless pulley. A block with unknown mass m is placed on top of M, and the constant of friction between M and the table is 0.25.

- Determine the minimal value of m such that M remains at rest.
- Determine the acceleration of M, once m is taken away.

Problem 2. (K. & K. Ex. 4.1) The mass per unit length of a non-uniform rod of length ℓ is given by $\lambda = A\cos(\pi x/2\ell)$, where x is the position along the rod, $0 \leq x \leq \ell$.

1. What is the mass M of the rod?
2. What is the coordinate X of the center of mass?