

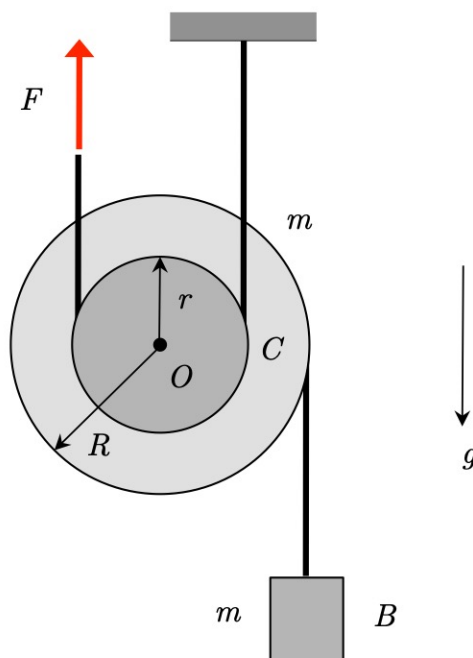
Homework H.5.D

Given: An inextensible cable is wrapped around the inner radius of a solid, stepped drum (having a mass of m , inner radius r , outer radius R and radius of gyration about its center O of k_O). One end of the cable is attached to ground, with a vertical force F acting at the free end of the cable. A second inextensible cable is wrapped around the outer radius of the drum with block B (of mass m) attached at its free end. Neither cable slips on the drum as the system moves. The system is released from rest.

Find: On release:

- Determine the angular acceleration of the drum.
- Determine the acceleration of block B.

HINT: Since the drum does not slip on the cables, point C is the instant center for the drum.



Use the following parameters in your analysis: $m = 8$ kg, $R = 0.5$ m, $r = 0.25$ m, $k_O = 0.3$ m and $F = 20$ N.