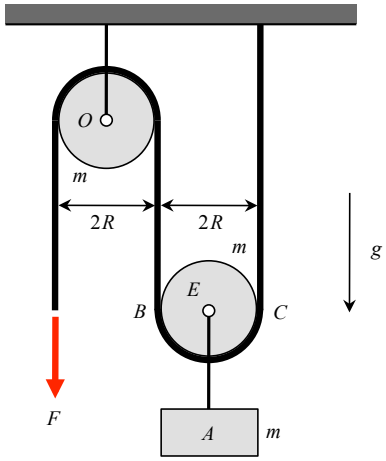
Homework H.5.H

Given: A homogeneous disk of mass m and outer radius R is supported by the cable-pulley system shown. The pulley (having a mass of m and with an outer radius of R) is supported by a smooth shaft at its center O. Block A (with a mass of m) is supported at the center E of the disk. A constant force F is applied to the free end of the cable. The system is released from rest. Assume the pulley and disk do not slip on the cable.

Find:
(a) Determine the direction of motion of block A on release; and
(b) Determine the speed of block A after A has moved through a distance of s_A.



Use the following parameters in your analysis: $m = 15$ kg, $R = 0.25$ m, $s_A = 0.5$ m and $F = 300$ N.