Homework H5.J

**Given:** A drum has a mass of M, outer radius of R, inner radius of r, a centroidal radius of gyration of k_G and a centroid at the geometric center G. A cable is wrapped around the inner radius of the drum and is connected to particle A having a mass of m. The cable is also wrapped over an ideal pulley. A spring of stiffness K is attached between G of the drum and ground. The system is released from rest with the spring unstretched.

Find: Determine the speed of A after it has dropped through a distance of d.
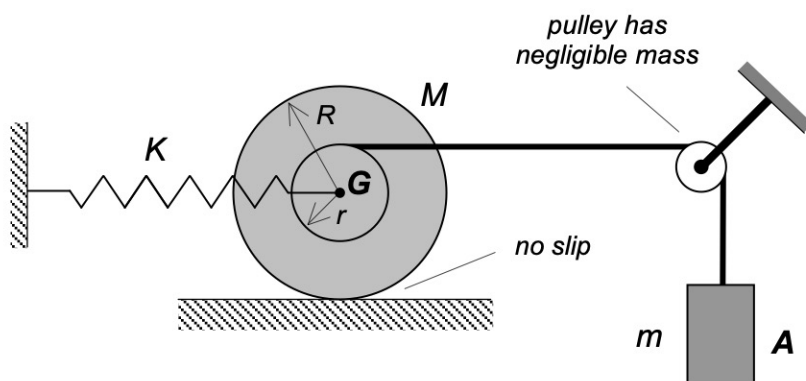
Use the following parameters in your analysis: $M = 30$ kg, $m = 10$ kg, $R = 0.5$ m, $r = 0.25$ m, $k_G = 0.3$ m, $K = 10$ N/m and $d = 2$ m.