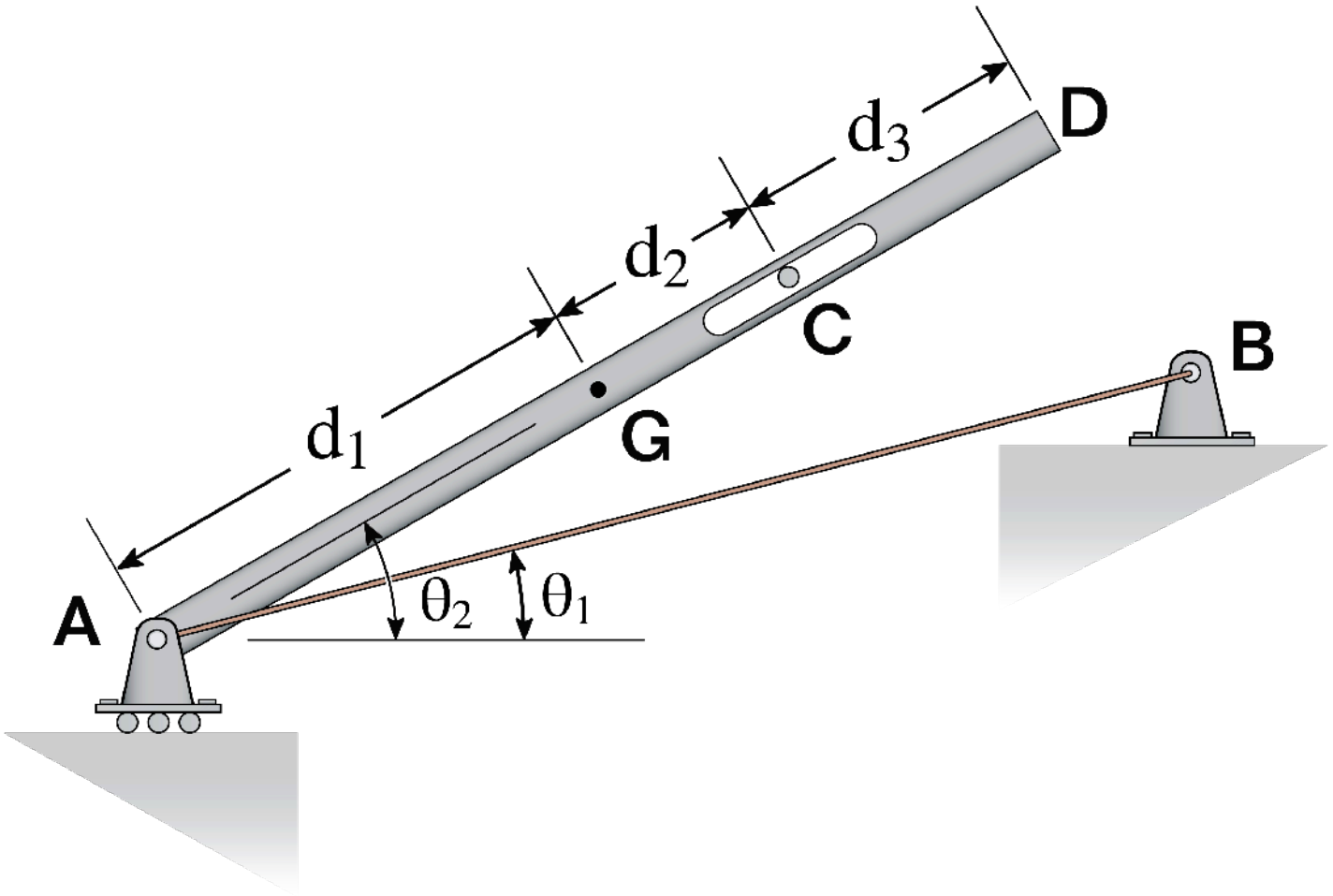

A bar with total mass m and a center of mass at G is supported by a roller at A, a cable AB, and a smooth peg inside a slot within the bar at C. Determine the reactions at the supports. Assume $g = 9.81\ \text{N/kg}$

$$\Sigma M_A = 0 \rightarrow (d_1 + d_2)N_C - (d_1\ \cos(\theta_2))mg = 0 \rightarrow N_C = \frac{(d_1 \cos(\theta_2))mg}{d_1 + d_2}$$

$$\Sigma F_x = 0 \rightarrow T_{AB}\cos(\theta_1) - N_C \sin(\theta_2) = 0 \rightarrow T_{AB} = N_C \frac{\sin(\theta_2)}{\cos(\theta_1)}$$

$$\Sigma F_y = 0 \rightarrow N_A + T_{AB}\sin(\theta_1) + N_C \cos(\theta_2) - mg = 0 \rightarrow N_A = mg - T_{AB}\sin(\theta_1) - N_C \cos(\theta_2)$$