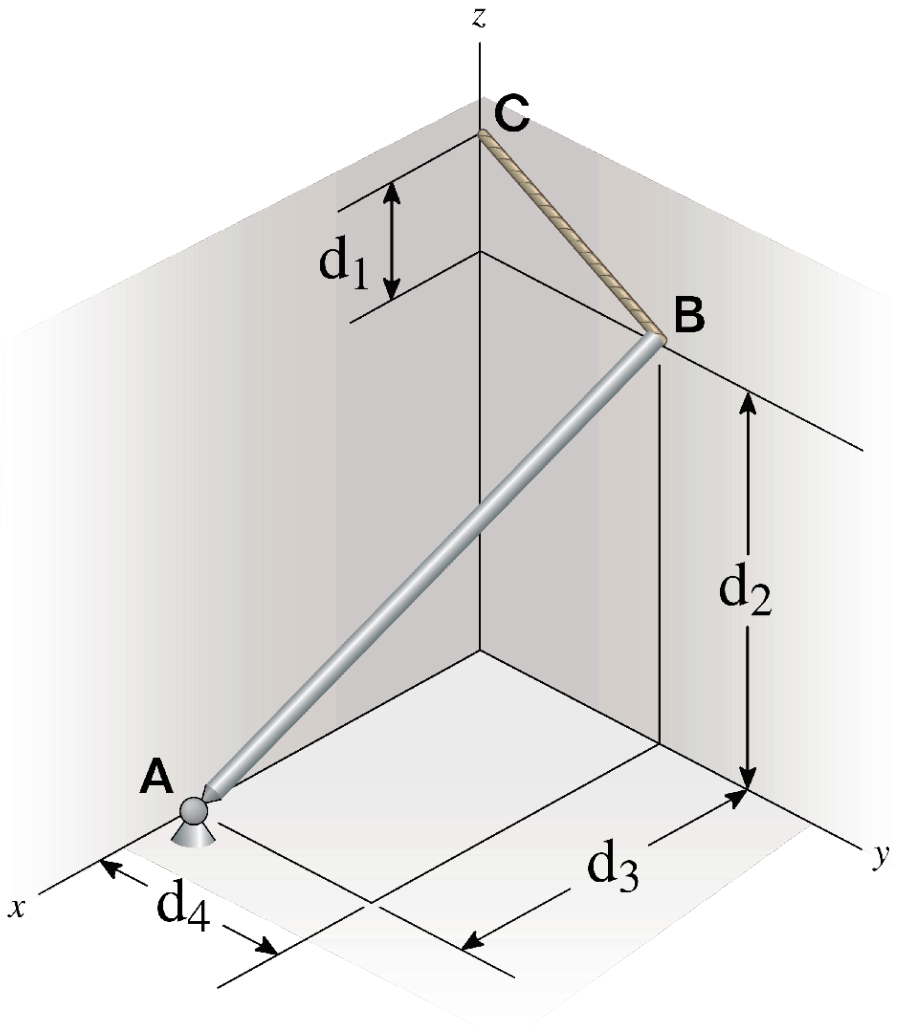

A smooth leaning rod has a uniform mass $m\,\mathrm{kg}$ and is supported by a ball-and-socket joint at point A, the wall at point B, and a cable BC. Find the reaction components of the supports. Assume $g = 9.81\,\mathrm{N/kg}$ and that the wall is frictionless. Let reaction components be positive if pointing along the positive axes.

$$BC = \sqrt{{d_1}^2 + {d_4}^2}$$

$$\Sigma(M_x)_A = 0 \rightarrow d_4 \frac{d_1}{BC} T_{BC} + d_2 \frac{d_4}{BC} T_{BC} - \frac{d_4}{2} mg = 0 \rightarrow T_{BC} = \frac{BCmg}{2(d_1 + d_2)}$$

$$\Sigma F_y = 0 \rightarrow A_y - \frac{d_4}{BC} T_{BC} = 0 \rightarrow A_y = \frac{d_4}{BC} T_{BC}$$

$$\Sigma F_z = 0 \rightarrow A_z + \frac{d_1}{BC} T_{BC} - mg = 0 \rightarrow A_z = mg - \frac{d_1}{BC} T_{BC}$$

$$\Sigma(M_y)_A = 0 \rightarrow d_2 N_B + d_3 \frac{d_1}{BC} T_{BC} - \frac{d_3}{2} mg = 0 \rightarrow N_B = \frac{d_3 \left(\frac{mg}{2} - \frac{d_1}{BC} T_{BC} \right)}{d_2}$$

$$\Sigma(M_z)_A = 0 \rightarrow d_3 \frac{d_4}{BC} T_{BC} - d_4 N_B = 0 \rightarrow N_B = \frac{d_3}{BC} T_{BC}$$

$$\Sigma F_x = 0 \rightarrow A_x + N_B = 0 \rightarrow A_x = -N_B$$