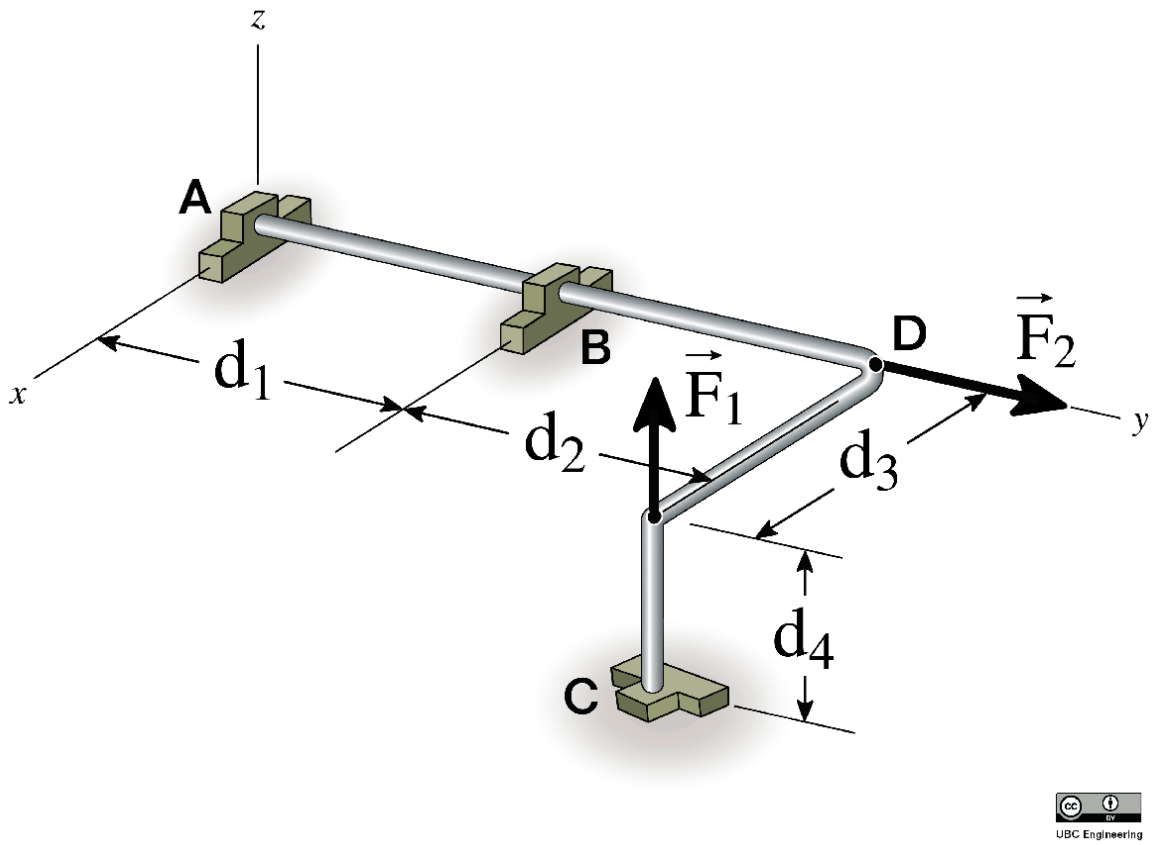

UBC Engineering

The bent rod is supported by three smooth journal bearings at point A, B, and C. If two forces $\vec{F}_1$ and $\vec{F}_2$ are exerted onto the rod as shown, find the reactions at the supports. Assume there are no couple moments formed by the supports and that the bar has negligible mass.

$$\Sigma F_y = 0 \rightarrow F_2 + C_y = 0 \rightarrow C_y = -F_2$$

$$\Sigma (M_y)_D = 0 \rightarrow -d_3 F_1 - d_4 C_x = 0 \rightarrow C_x = -\frac{d_3}{d_4} F_1$$

$$\Sigma (M_x)_A = 0 \rightarrow d_1 B_z + d_4 C_y + (d_1 + d_2) F_1 = 0 \rightarrow B_z = -\frac{d_4 C_y + (d_1 + d_2) F_1}{d_1}$$

$$\Sigma F_z = 0 \rightarrow A_z + B_z + F_1 = 0 \rightarrow A_z = -B_z - F_1$$

$$\Sigma (M_z)_A = 0 \rightarrow d_3 C_y - d_1 B_x = 0 \rightarrow B_x = \frac{d_3}{d_1} C_y$$

$$\Sigma F_x = 0 \rightarrow A_x + B_x + C_x = 0 \rightarrow A_x = -B_x - C_x$$