



Find the support reaction components at the **fixed** support A if the forces above are acting on the cantilevered beam. Assume the mass of the beam is negligible, that reaction force component vectors point upward and right (- components if force is exerted in the other direction) and that counterclockwise moments are positive.

$$\Sigma F_x = 0 \rightarrow A_x + F_2 \cos(\theta_2) = 0 \rightarrow A_x = -F_2 \cos(\theta_2)$$

$$\Sigma F_y = 0 \rightarrow A_y - F_1 - F_2 \sin(\theta_2) = 0 \rightarrow A_y = F_1 + F_2 \sin(\theta_2)$$

$$\Sigma M_A = 0 \rightarrow M_A - d_1 \cdot F_1 - (d_1 + d_2 + d_3 \cos(\theta_1)) \cdot F_2 \sin(\theta_2) - d_3 \sin(\theta_1) \cdot F_2 \cos(\theta_2) = 0$$

$$\rightarrow M_A = d_1 \cdot F_1 + (d_1 + d_2 + d_3 \cos(\theta_1)) \cdot F_2 \sin(\theta_2) + d_3 \sin(\theta_1) \cdot F_2 \cos(\theta_2)$$