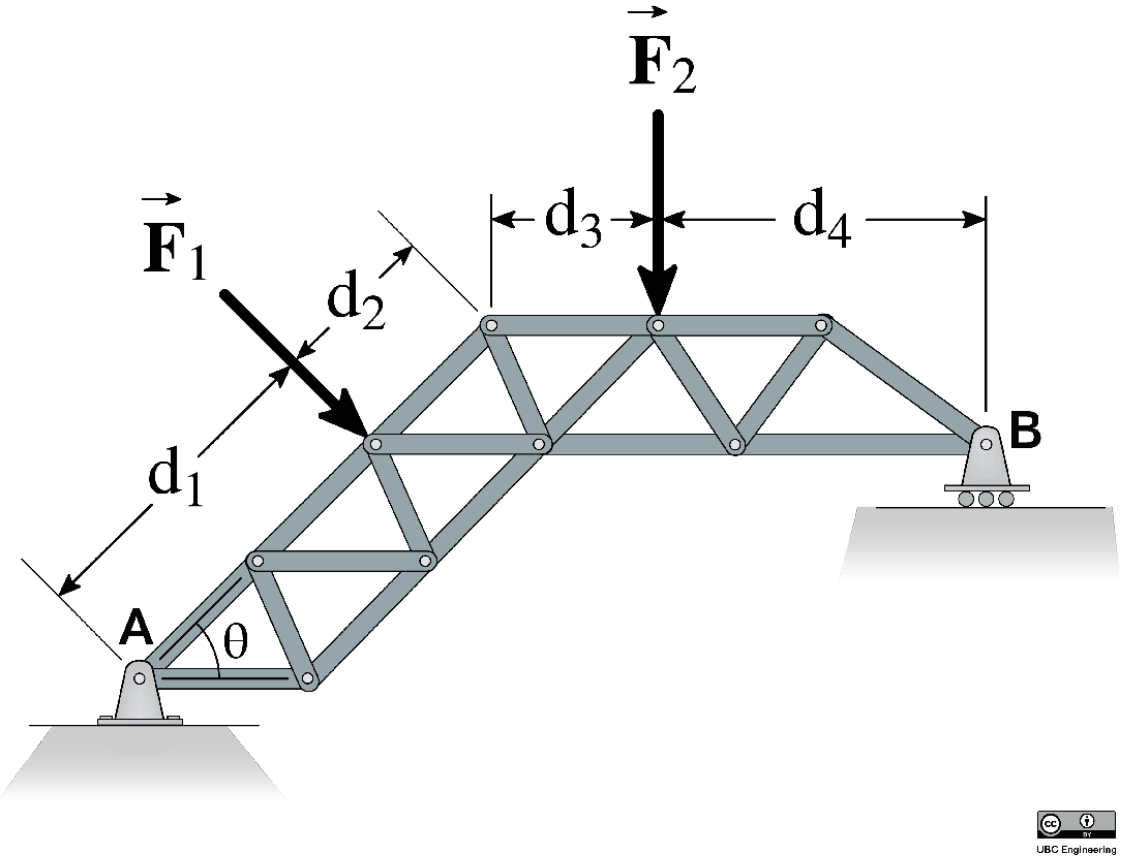

A truss has two forces $\vec{F_1}$ and $\vec{F_2}$ acting on it as shown above. If the truss is supported by a pin at A and a roller at B, find the support reaction components needed to achieve static equilibrium. Ignore the mass of the truss.

How many unknown reaction components need to be determined in this **2D** system?

3

Find the support reactions at point A and B. Use 0 if the reaction component does not exist for the specified support. Assume reaction components are positive if they point up or right.

$B_x = 0\,\mathrm{N}$

$M_A = M_B = 0\,\mathrm{N{*}m}$

$\Sigma F_x = 0 \rightarrow A_x + F_1 \sin(\theta) = 0 \rightarrow A_x = -F_1 \sin(\theta)$

$\Sigma M_A = 0 \rightarrow ((d_1 + d_2)\cos(\theta) + d_3 + d_4)B_y - d_1F_1 - ((d_1 + d_2)\cos(\theta) + d_3)F_2 = 0 \rightarrow B_y = \dfrac{d_1F_1 + ((d_1 + d_2)\cos(\theta) + d_3)F_2}{(d_1 + d_2)\cos(\theta) + d_3 + d_4}$

$$\Sigma F_y = 0 \rightarrow A_y + B_y - F_1 \cos(\theta) - F_2 = 0 \rightarrow A_y = F_1 \cos(\theta) + F_2 - B_y$$