Problem 3

Determine

Replace the system with a single equivalent resultant force and couple moment about point A.

Distributed Load

\[ F_R = \frac{1}{2} (3\text{m})(40\text{ N/m}) = 60\text{ N} \]
\[ X = \frac{2}{3} (3\text{m}) = 2\text{ m} \]

\[ \sum F_y = 0 \implies F = -100\text{ N} - 60\text{ N} = -160\text{ N} \]
\[ \Sigma M_A = M_{RA} = - (100 \text{N})(3 \text{m}) + 100 \text{N} \cdot \text{m} - (60 \text{N})(11 \text{m}) \]

\[ M_{RA} = -860 \text{ N} \cdot \text{m} \]