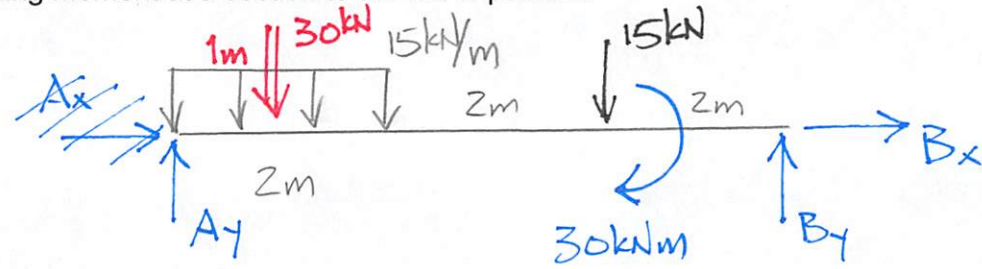
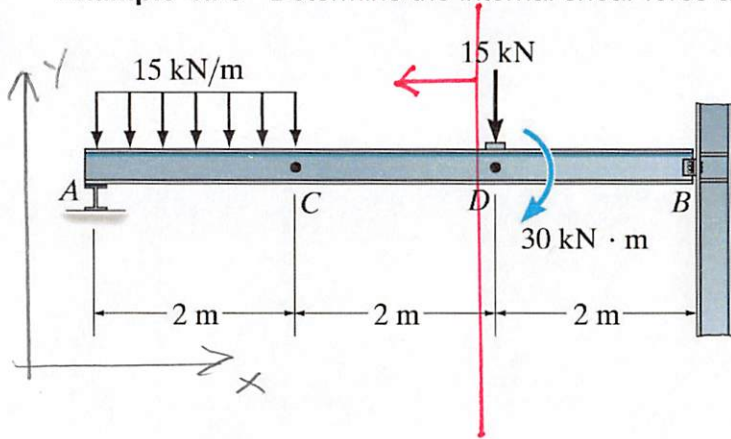
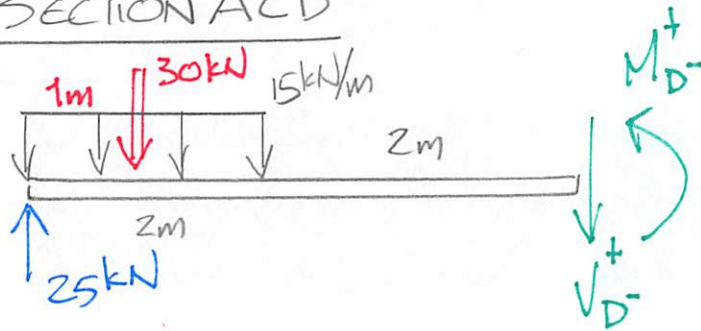


Example 4a-5 - Determine the internal shear force and bending moment at a section to the left of point D.



$$\begin{aligned} \sum M_B = 0 &= 15\text{ kN}(2\text{ m}) - 30\text{ kN}\cdot\text{m} + 30\text{ kN}(5\text{ m}) - A_y(6\text{ m}) \\ A_y &= 25\text{ kN} \end{aligned}$$

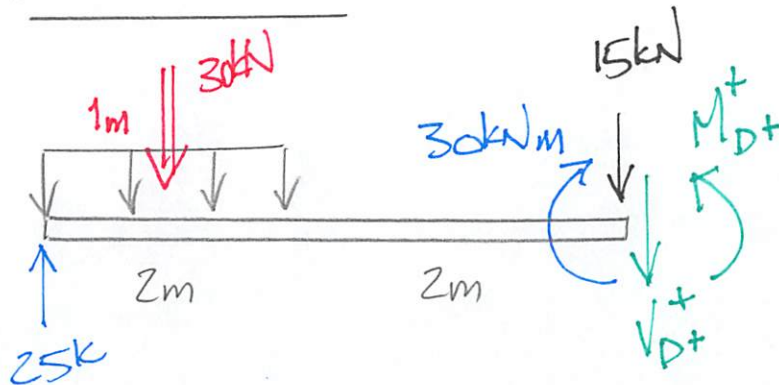
SECTION ACD⁻



$$\begin{aligned} \sum M_{\text{cut}} = 0 &= M_{D-} + 30\text{ kN}(3\text{ m}) - 25\text{ kN}(4\text{ m}) \\ M_{D-} &= 10\text{ kN}\cdot\text{m} \end{aligned}$$

$$\begin{aligned} \sum F_y = 0 &= -V_{D-} - 30\text{ kN} + 25\text{ kN} \\ V_{D-} &= -5\text{ kN} \end{aligned}$$

SECTION ACD⁺



$$\begin{aligned} \sum M_{\text{cut}} &= M_{D+} - 30\text{ kN}\cdot\text{m} + 30\text{ kN}(3\text{ m}) - 25\text{ kN}(4\text{ m}) \\ M_{D+} &= 40\text{ kN}\cdot\text{m} \end{aligned}$$

$$\begin{aligned} V_{D+} &= -20\text{ kN} \\ \Delta V &= -15\text{ kN} \end{aligned} \quad + \sum F_y = 0 = -V_{D+} - 15\text{ kN} - 30\text{ kN} + 25\text{ kN}$$