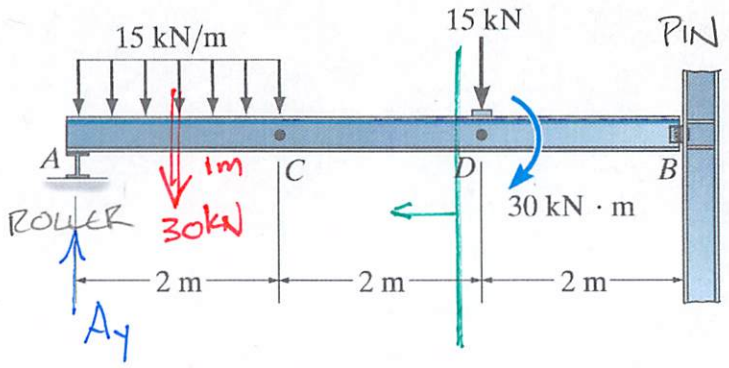
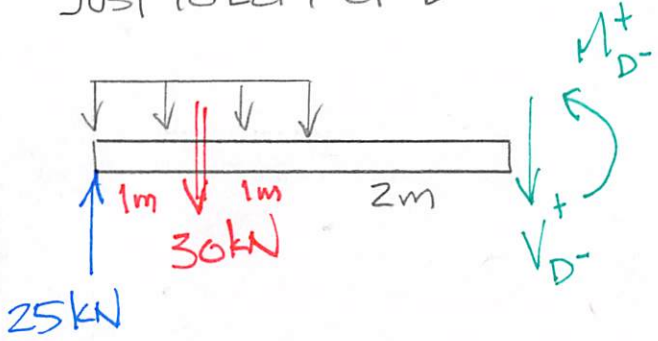
Example 4a-5 - Determine the internal shear force and bending moment at a section to left of point *D*.



$$\circlearrowleft +\sum M_B = 0 = 15\text{kN}(2\text{m}) + 30\text{kN}(5\text{m}) - 30\text{kNm} - A_y(6\text{m})$$

$$A_y = 25\text{kN}$$

JUST TO LEFT OF D



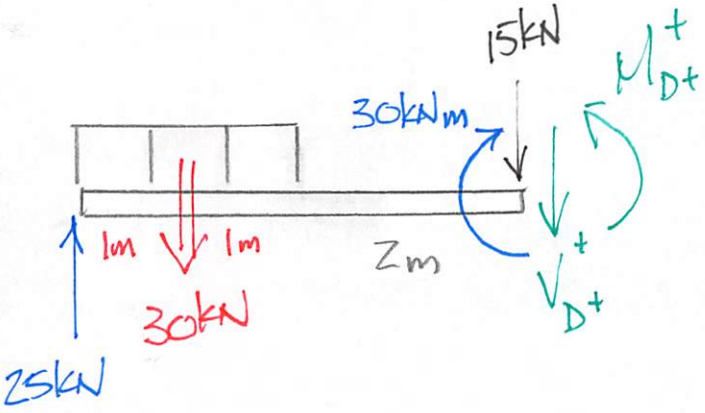
$$\circlearrowleft +\sum M_{CUT} = 0 = M_{D-} + 30\text{kN}(3\text{m}) - 25\text{kN}(4\text{m})$$

$$M_{D-} = 10\text{kNm}$$

$$+\uparrow \sum F_y = 0 = -V_{D-} - 30\text{kN} + 25\text{kN}$$

$$V_{D-} = -5\text{kN}$$

JUST TO RIGHT OF D



$$\circlearrowleft +\sum M_{CUT} = 0 = M_{D+} - 30\text{kNm} + 30\text{kN}(3\text{m}) - 25\text{kN}(4\text{m})$$

$$M_{D+} = 40\text{kNm} \qquad \Delta M_D = 30\text{kNm}$$

$$+\uparrow \sum F_y = 0 = -V_{D+} - 15\text{kN} - 30\text{kN} + 25\text{kN}$$

$$V_{D+} = -20\text{kN} \qquad \Delta V_D = -15\text{kN}$$