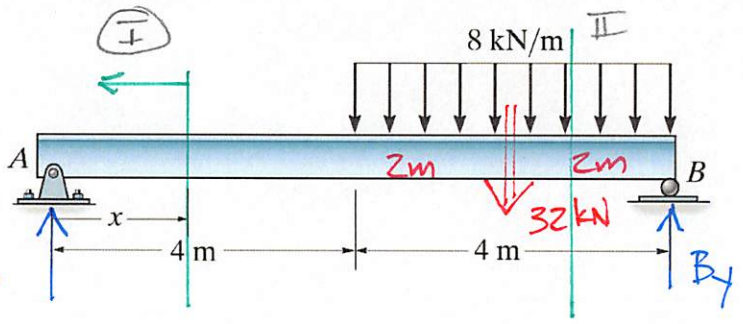
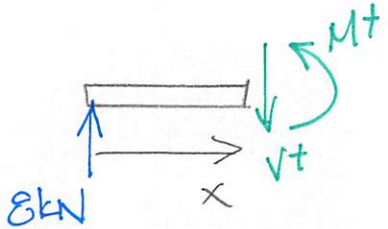
Example 4b-5 - Determine the internal shear and bending moment as a function of ***x***.



$\circlearrowleft +\sum M_B = 0 = 32\,kN(2m) - A_y(8m)$ $\quad A_y = 8\,kN$

$+\uparrow \sum F_y = 0 = A_y + B_y - 32\,kN$ $\quad B_y = 24\,kN$

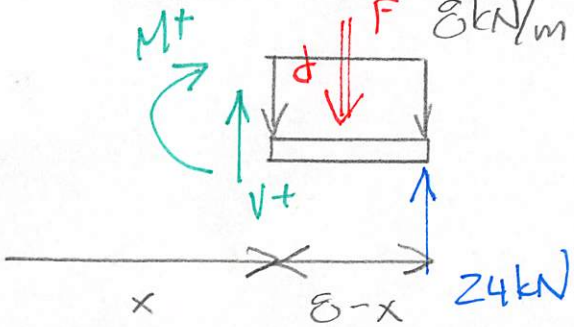
(I) $0 \le x \le 4$



$\circlearrowleft +\sum M_{CUT} = 0 = M - 8\,kN(x)$ $\quad M = [8x]\,kN\,m$ $\quad M(x=0) = 0$ ✓

$+\uparrow \sum F_y = 0 = -V + 8\,kN$ $\quad V = 8\,kN$ $\quad \frac{dM}{dx} = V$ ✓

(II) $4 \le x \le 8$



$F = 8(8-x)$ $\quad d = \frac{1}{2}(8-x)$

$\circlearrowleft +\sum M_{CUT} = 0 = -M - 8(8-x)\left(\frac{8-x}{2}\right) + 24(8-x)$

(F d)

$M = \left[-4(8-x)^2 + 24(8-x)\right] kN\,m$ $\quad M(x=8) = 0$ ✓

$+\uparrow \sum F_y = 0 = V - 8(8-x) + 24\,kN$

$V = \left[8(8-x) - 24\right] kN$ $\quad V(x=8) = -24\,kN$ ✓