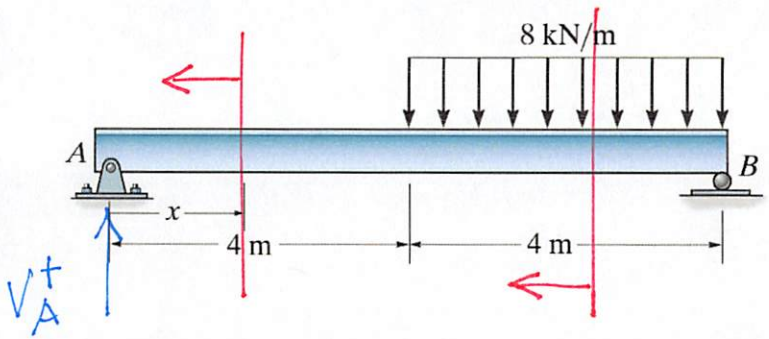
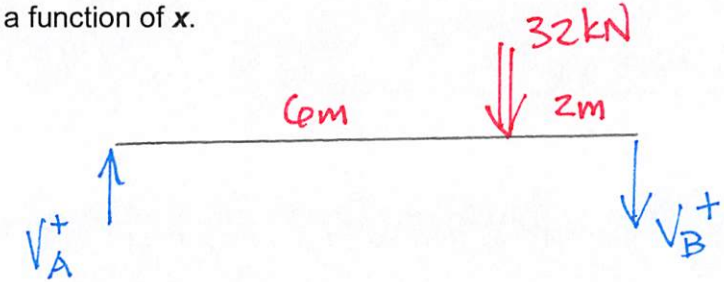
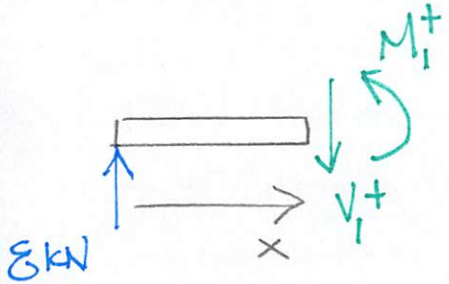
Example 4b-5 - Determine the internal shear and bending moment as a function of ***x***.





$$\circlearrowleft +\Sigma M_B = 0 = 32\,kN(2m) - V_A(8m) \qquad V_A = 8\,kN$$

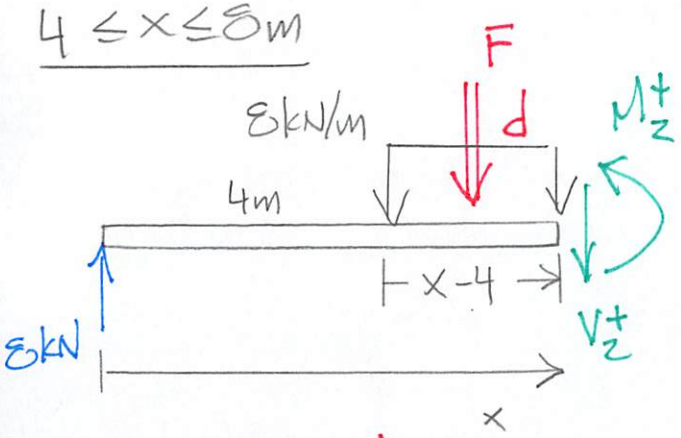
$0 \le x \le 4m$



$$\circlearrowleft +\Sigma M_{CUT} = 0 = M_1 - 8kN(x) \qquad M_1 = [8x]\,kN\,m$$

$$+\uparrow \Sigma F_y = 0 = -V_1 + 8kN \qquad V_1 = 8kN \qquad \frac{dM}{dx} = V \;\checkmark$$

$4 \le x \le 8m$



$$F = 8(x-4)\,kN$$

$$d = \tfrac{1}{2}(x-4)\,m$$

$$\circlearrowleft +\Sigma M_{CUT} = 0 = M + F\,d - 8x$$

$$M_2 = [-4(x-4)^2 + 8x]\,kN\,m \qquad M_2(x=8) = 0 \;\checkmark$$

$$M_1(x=4) = M_2(x=4) \;\checkmark$$

$$+\uparrow \Sigma F_y = 0 = -V_2 - 8(x-4) + 8 \qquad \frac{dM}{dx} = V \;\checkmark$$

$$V_2 = [-8(x-4) + 8]\,kN$$