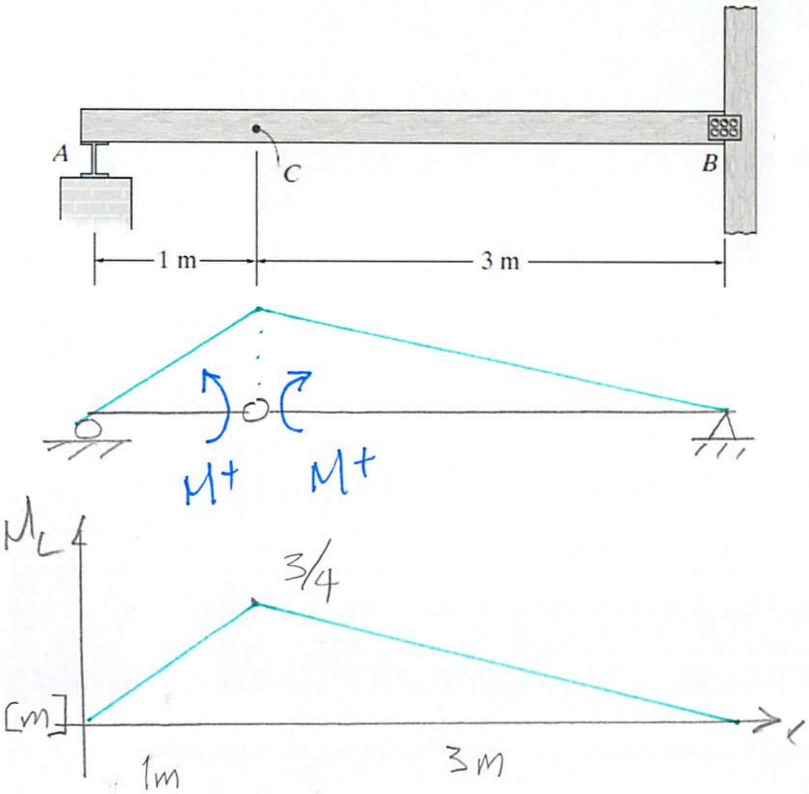
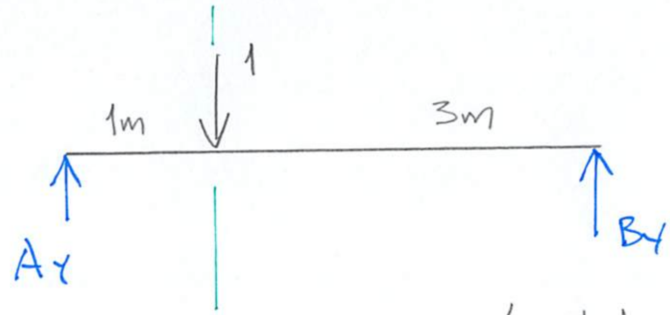
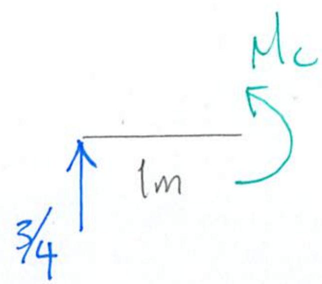
Example 6b-1: The beam supports a uniform dead load of 500 N/m and a single live concentrated force of 3 kN. Determine (a) the maximum positive moment at *C* and (b) the maximum positive shear at C.





$\circlearrowleft + \sum M_B = 0 = 1(3m) - A_y(4m)$

$A_y = 3/4$

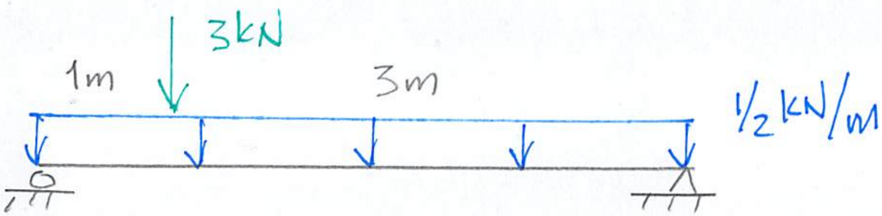


$\circlearrowleft + \sum M_c = 0 = M_c - \frac{3}{4}(1m)$

$M_c = \frac{3}{4} m$

$$M_{C_{MAX}} = 3kN(3/4m) + 1/2\,kN/m\left(\tfrac{1}{2}\right)(4m)(3/4m) = 3\,kNm$$

CONCENTRADED FORCE — UNIFORM DEAD LOAD



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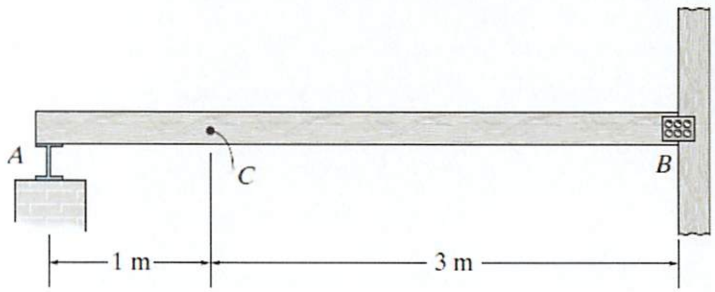

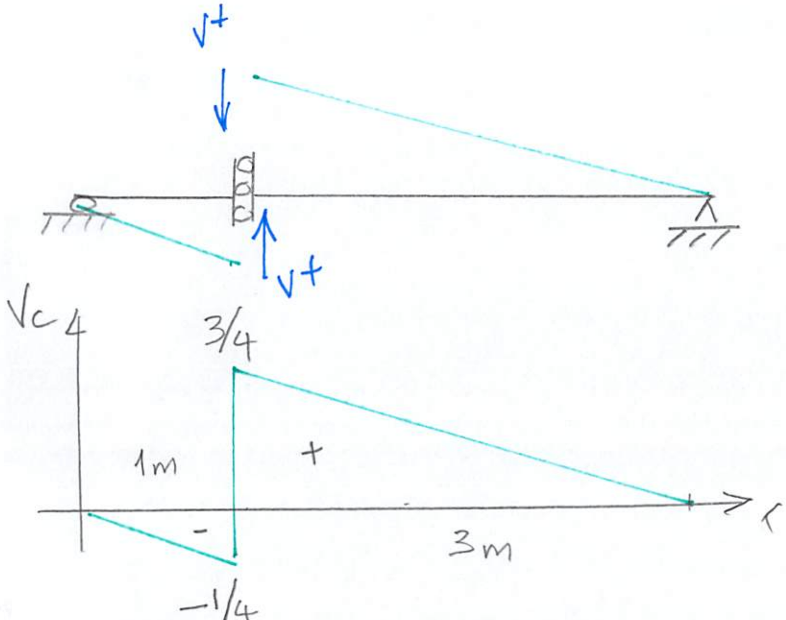

UNIFORM DEAD LOAD

$$V_{C_{MAX}} = 3kN\left(\tfrac{3}{4}\right) + \tfrac{1}{2}kN/m\left(\tfrac{1}{2}\right)\left[1m\left(-\tfrac{1}{4}\right) + 3m\left(\tfrac{3}{4}\right)\right]$$

LIVE CONCENTRATED FORCE

$$= 2.75\ kN$$

* LIVE UNIFORM LOAD 1 kN/m

$$1\,kN/m\left(\tfrac{1}{2}\right)(3m)\left(\tfrac{3}{4}\right) = 1.125\,kN$$