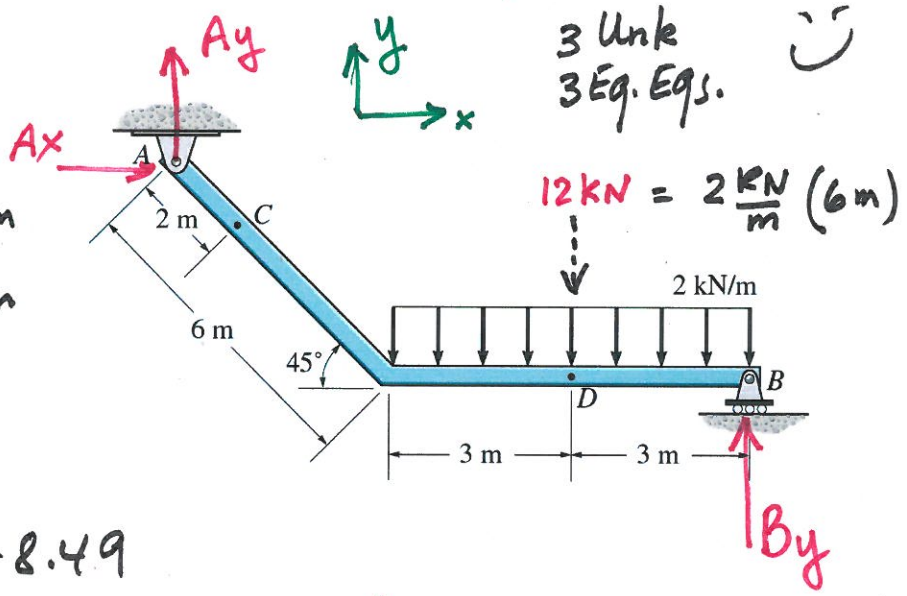
Problem 1 – Internal Forces II

Determine the internal normal force, shear force, and the moment at points *C* and *D*. ↳N ↳V ↳M



3 Unk
3 Eq. Eqs.

$\circlearrowleft \Sigma M_A = 0$

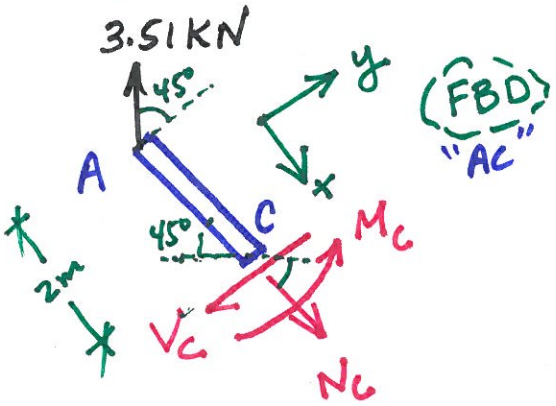
$0 = -12\,kN(3 + 6\cos 45°)m + B_y(6 + 6\cos 45°)m$

$B_y = 8.49\,kN \uparrow$

$\uparrow \Sigma F_y = 0 = A_y - 12 + 8.49$

$A_y = 3.51\,kN \uparrow$

$\rightarrow \Sigma F_x = 0 = A_x$



$\searrow \Sigma F_x = 0 = -3.51\sin 45 + N_C$

$N_C = 2.48\,kN$ ↘45° on CA

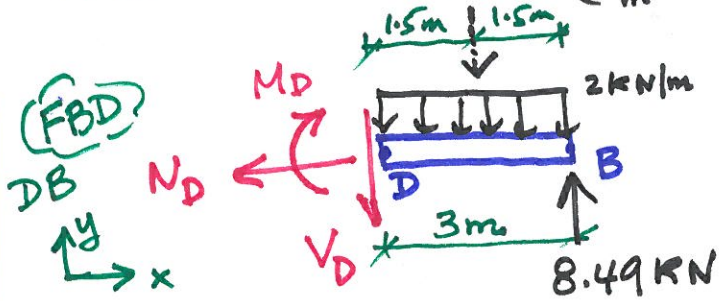
$\nearrow \Sigma F_y = 0 = 3.51\cos 45 - V_C$

$V_C = 2.48\,kN$ ↙45° on CA

$\circlearrowleft \Sigma M_C = 0 = -3.51(\cos 45)(2m) + M_C$

$M_C = 4.96\,kN.m$ ↻ on CA

6 kN = (2 kN/m × 3m)



$\rightarrow \Sigma F_x = 0 = N_D$

$\uparrow \Sigma F_y = 0 = -V_D - 6 + 8.49$

$V_D = 2.49\,kN \downarrow$ on DB

$\circlearrowleft \Sigma M_D = 0 = -M_D - 6(1.5) + 8.49(3)$

$M_D = 16.47\,kN.m$ ↺ on DB