DTY Tutoring, inc.
Email: dtytutoring@gmail.com
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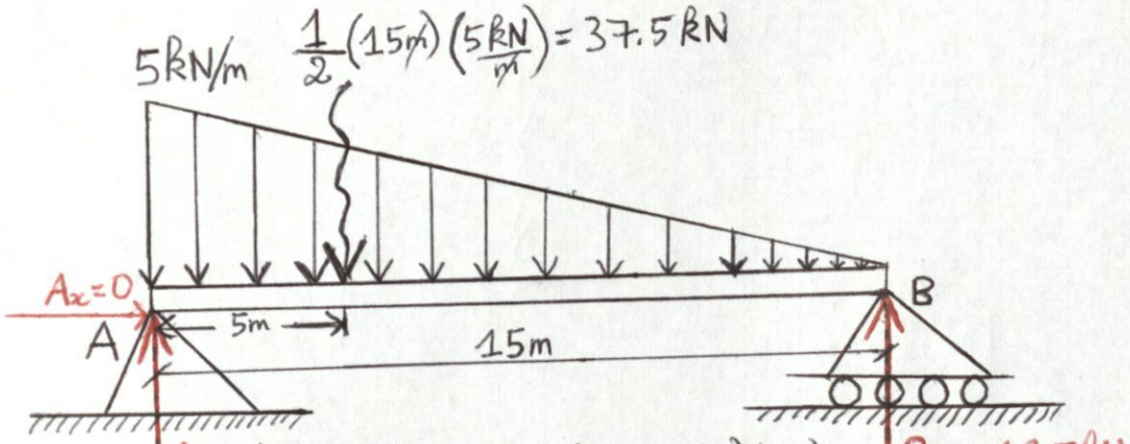
Date: 10th October 2018



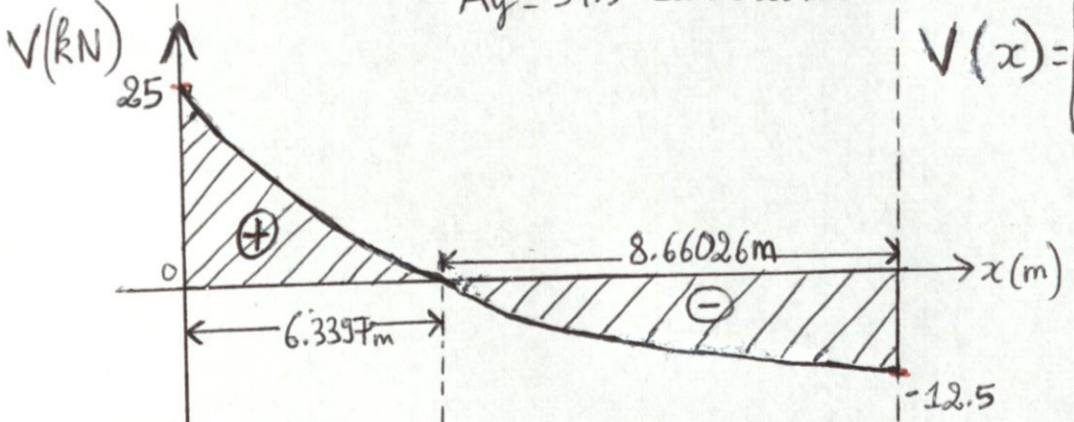
$25kN = A_y + \left(\sum M_A = 0;\ (-37.5kN)(5m)+(B_y)(15m)=0\right)$ $B_y = 12.5kN$

$B_y = 12.5kN$

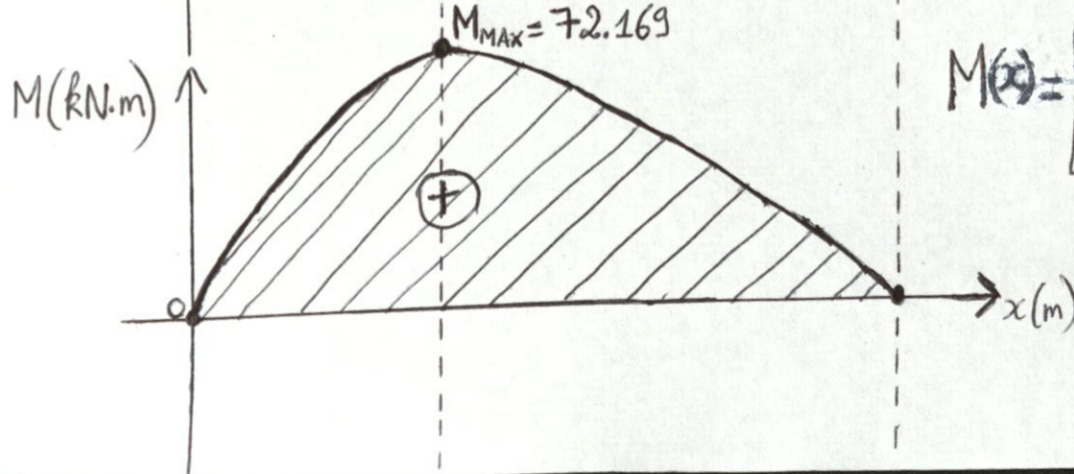
$\pm\rightarrow \sum F_x = 0;\quad A_x = 0$

$+\uparrow \sum F_y = 0;\quad A_y + B_y = 37.5kN$

$A_y = 37.5 - 12.5 = 25kN$



$$V(x) = \left[\frac{(15-x)^2}{6} - 12.5\right] kN$$



$$M(x) = \left[\frac{-(15-x)^3}{18} + 12.5(15-x)\right] kN\text{-}m$$

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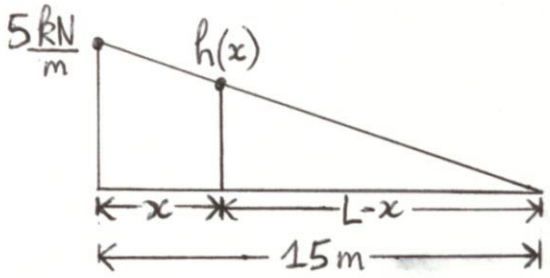
Using Similar Triangles, find h(x)

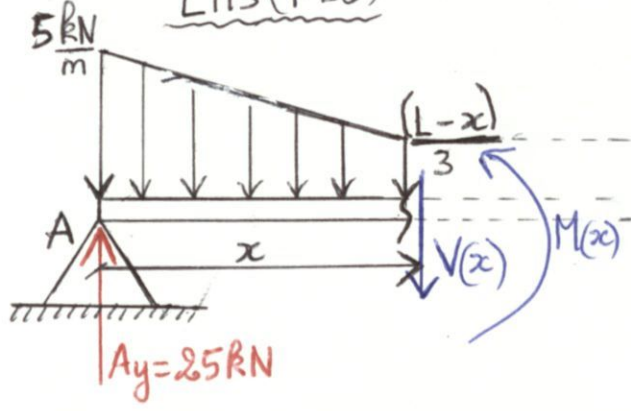


$$\frac{5\,kN/m}{15m} = \frac{h(x)}{(L-x)}$$

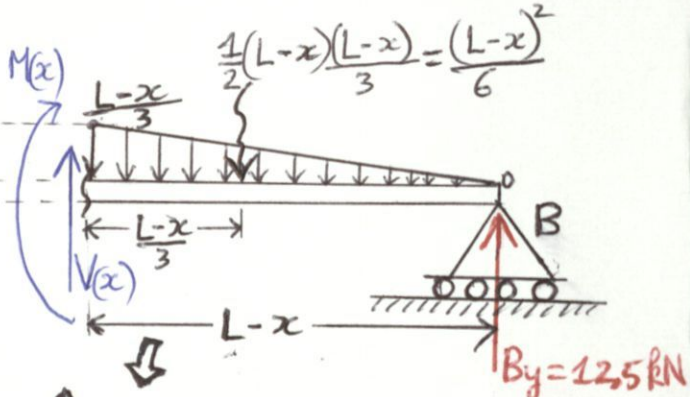
$$h(x) = \frac{(L-x)}{3}$$

Cut the beam to find the equation of V & M

LHS(FBD)



RHS(FBD)



$$+\uparrow \Sigma F_y = 0$$

$$V(x) + 12.5 = \frac{(L-x)^2}{6}$$

$$V(x) = \left[\frac{(L-x)^2}{6} - 12.5\right] kN \xleftarrow{L=15m} V(x) = \left[\frac{(15-x)^2}{6} - 12.5\right] kN$$

$$+\circlearrowright \Sigma M_x = 0$$

$$-M(x) + \left[-\frac{(L-x)^2}{6}\right]\left(\frac{L-x}{3}\right) + (12.5)(L-x) = 0$$

$$M(x) = \left[-\frac{(L-x)^3}{18} + 12.5L - 12.5x\right] kN\cdot m$$

$L=15m$

$$M(x) = \left[-\frac{(15-x)^3}{18} + 12.5(15-x)\right] kN\cdot m$$