

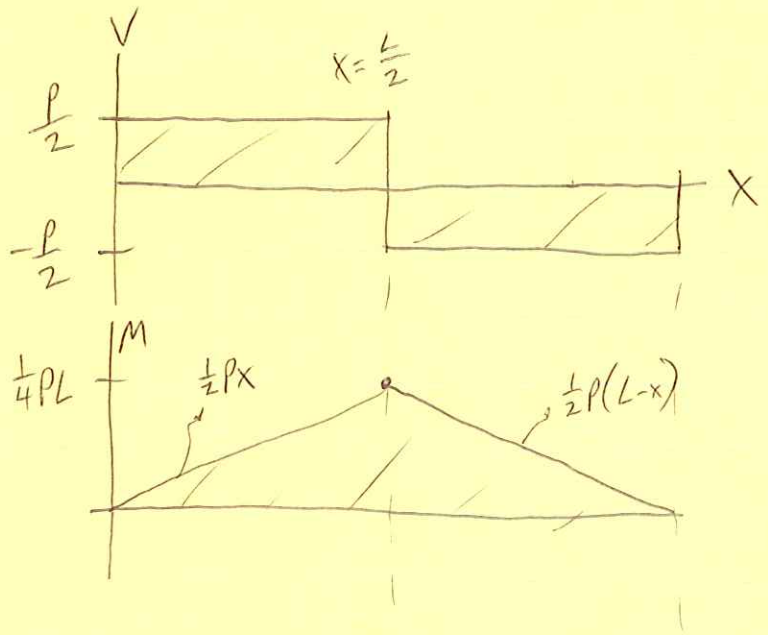
$$\sum M_D = 0 \rightarrow$$

$$M_D - \frac{1}{2}Px + (x - \frac{L}{2})P = 0$$

$$M_D = \frac{1}{2}Px - Px + \frac{1}{2}PL$$

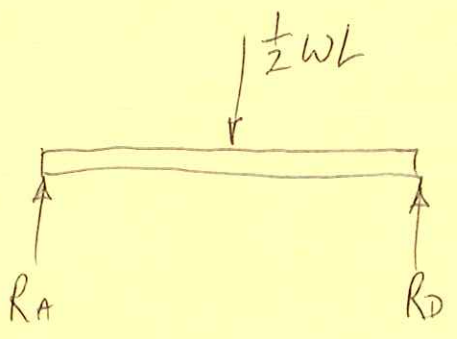
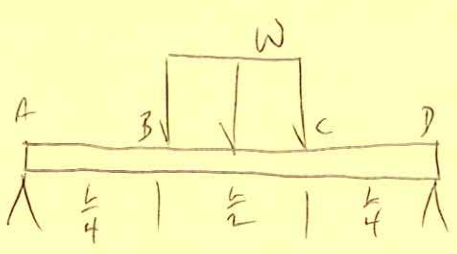
$$M_D = \frac{1}{2}P(L-x)$$

SHEAR DIAGRAM:



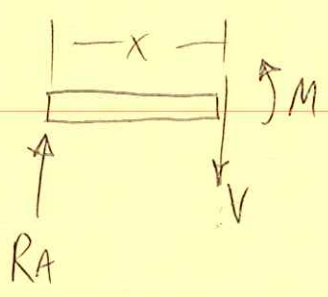
BENDING  
MOMENT  
DIAGRAM:

EXAMPLE PROB. 7.30



PROBLEM IS SYMMETRIC :  $R_A = \frac{1}{4}WL$ ,  $R_D = \frac{1}{4}WL$

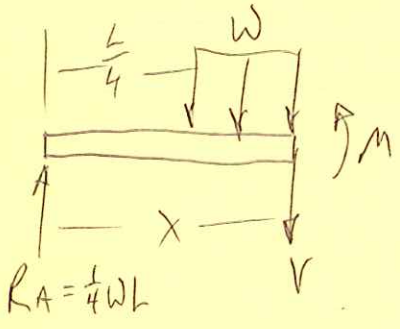
FBD OF ~~AD~~ ~~AD~~: BETWEEN A + B:



$$\sum F_y = 0 : V = \frac{1}{4}WL$$

$$\sum M = 0 \rightarrow : M = \frac{1}{4}WLx$$

FBD BETWEEN B + C:



$$\sum F_y = 0 : R_A - V - w(x - \frac{L}{4}) = 0$$

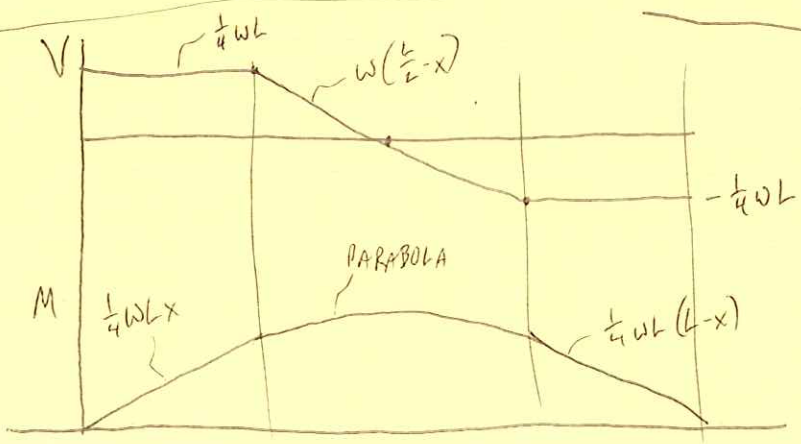
$$V = w(\frac{L}{2} - x)$$

$$\sum M = 0 \rightarrow :$$

$$M - \frac{1}{4}WLx + \left[ \frac{1}{2}(x - \frac{L}{4}) \right] \left[ w(x - \frac{L}{4}) \right] = 0$$

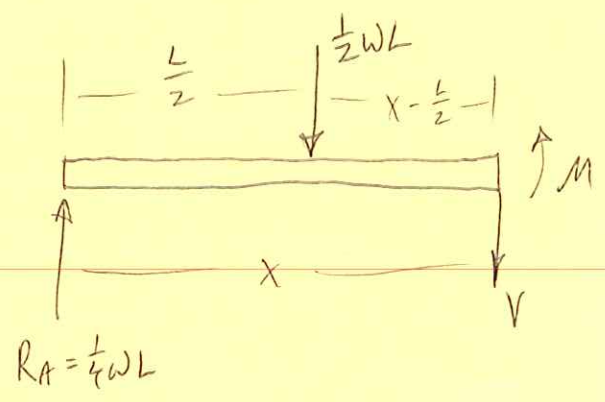
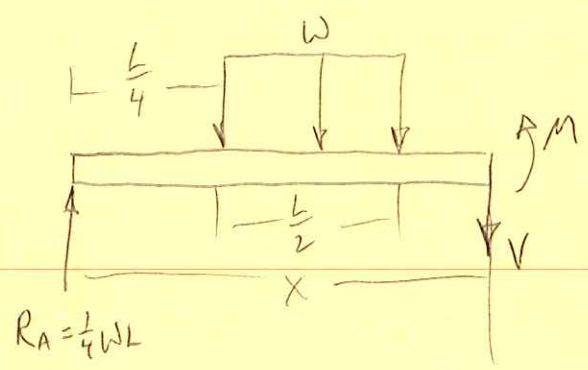
$$M = \frac{1}{4}WLx - \frac{1}{2}w(x - \frac{L}{4})(x - \frac{L}{4})$$

$$M = -\frac{w}{32}(16x^2 - 16xL + L^2)$$



**NEXT PAGE**

FBD BETWEEN C + D :



$$\sum F_y = 0: \frac{1}{4}WL - \frac{1}{2}WL - V = 0$$

$$V = -\frac{1}{4}WL$$

$$\sum M = 0 \uparrow :$$

$$M - \frac{1}{4}WLx + \left(\frac{1}{2}WL\right)\left(x - \frac{L}{2}\right) = 0$$

$$M = \frac{1}{4}WL(L-x)$$