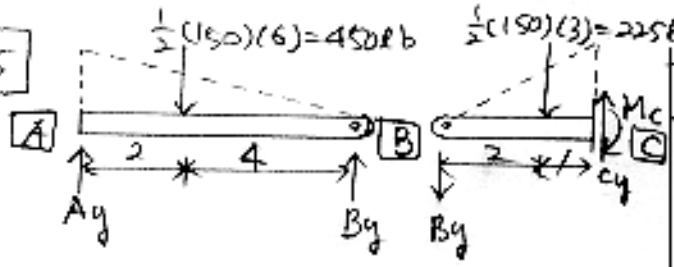
12-331 Solid Mechanics

HW #7 Due: 10/26/2000

6-25



Segment AB;

$\circlearrowleft \Sigma M_B=0$; $450(4)-A_y(6)=0$

$A_y = 300.0\,(lb)$

$\uparrow \Sigma F=0$; $B_y - 450 + 300 = 0$

$B_y = 150\,(lb)$

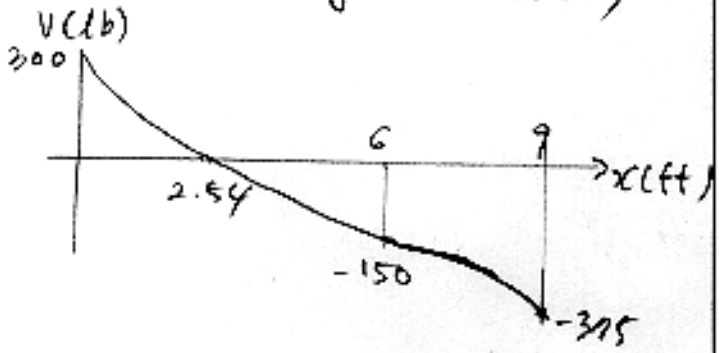
Segment BC;

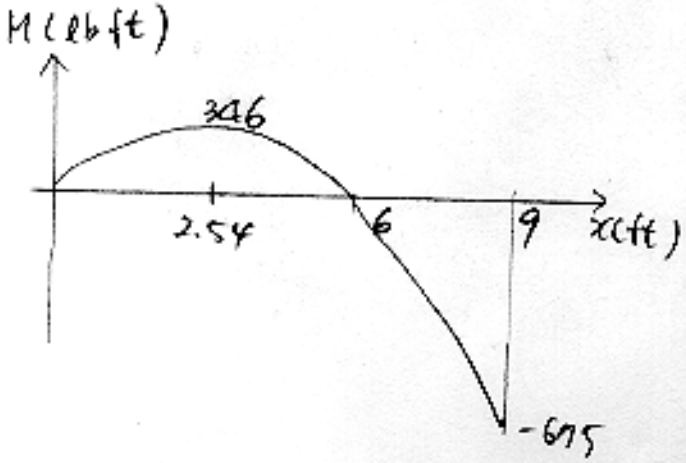
$\circlearrowleft \Sigma M_C=0$; $225(1)+150(3)-M_C=0$

$M_C = 675.0\,(lb\cdot ft)$

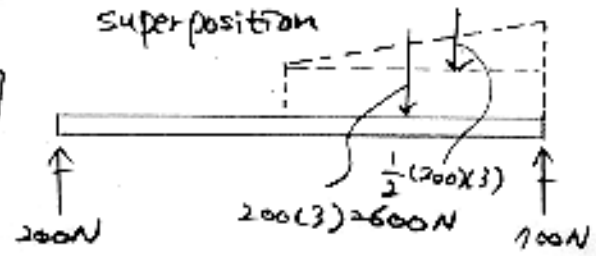
$\uparrow \Sigma F=0$; $C_y - 150 - 225 = 0$

$C_y = 375.0\,(lb)$

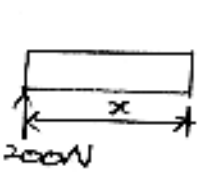




6-28



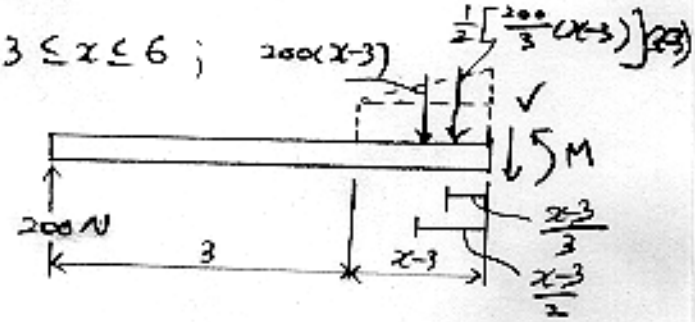
For $0 \le x < 3$;



$\uparrow \Sigma F_y=0$; $200 - V = 0$; $V = 200\,N$

$\circlearrowleft \Sigma M = 0$; $M - 200x = 0$; $M = (200x)$

For $3 \le x \le 6$;



$\uparrow \Sigma F=0$; $200 - 200(x-3) - \frac{1}{2}\left[\frac{200}{3}(x-3)\right](x-3) - V = 0$

$V = \left\langle -\frac{100}{3}x^2 + 500 \right\rangle N$

$V=0 \Rightarrow x = 3.873\,(m)$

$\circlearrowleft \Sigma M = 0$;

$M + \frac{1}{2}\left[\frac{200}{3}(x-3)\right](x-3)\left(\frac{x-3}{3}\right) + 200(x-3)\left(\frac{x-3}{2}\right) - 200x = 0$

$M = \left\langle -\frac{100}{9}x^3 + 500x - 600 \right\rangle N\cdot m$

at $x = 3.87$ $\quad M = 691\,N\cdot m$