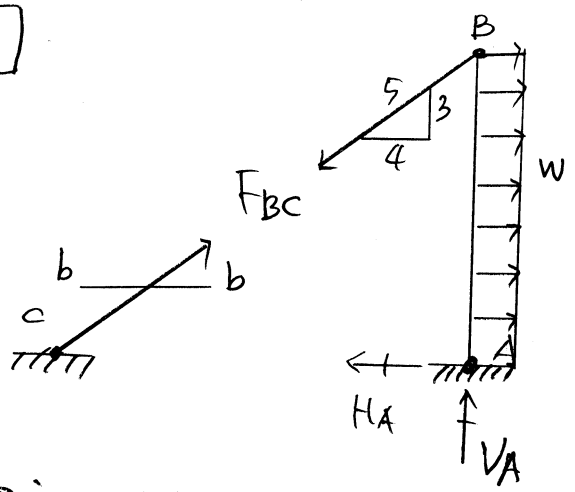
12-331 Solid Mechanics

HW #1 Due: 9/5/00

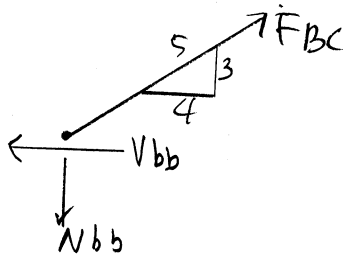
1-69



$\Sigma M_A = 0$; $w(3)(3/2) - F_{BC}\left(\frac{4}{5}\right)(3) = 0$

$F_{BC} = 1.875\ W$

(Section b-b)



$\Sigma F_x = 0$; $V_{bb} - F_{BC}\left(\frac{4}{5}\right) = 0$

$V_{bb} = 1.5\ W$

$\Sigma F_y = 0$; $N_{bb} - F_{BC}\left(\frac{3}{5}\right) = 0$

$N_{bb} = 1.125\ W$

$$\sigma_{bb} = \frac{N_{bb}}{A_{bb}} = \frac{1.125\,W}{\left(\frac{5}{3}\right)(0.9)(10^{-3})}$$

$$= 15 \times 10^6 \left(N/m^2\right)$$

$W(5) = 20{,}000\ N/m$

$$\tau_{bb} = \frac{V_{bb}}{A_{bb}} = \frac{1.5(W)}{\left(\frac{5}{3}\right)(0.9)(10^{-3})}$$

$$= 16 \times 10^6\ (N/m^2)$$

$W(z) = 16{,}000\ (N/m)$

$W = 16{,}000\ N/m = 16\ kN/m$