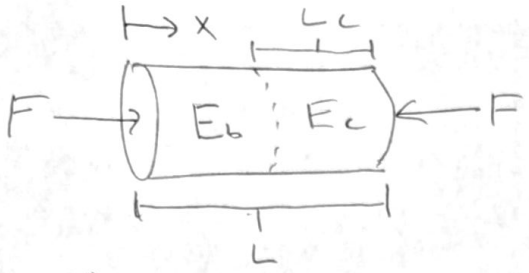
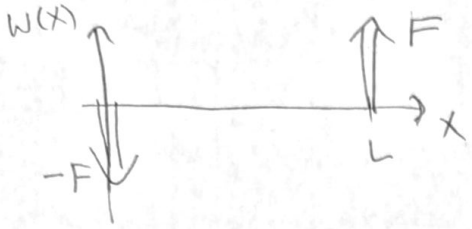
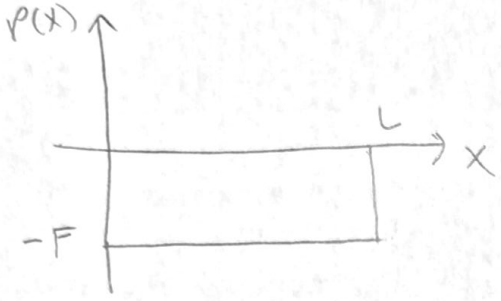
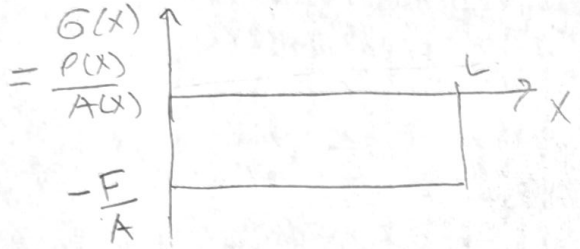
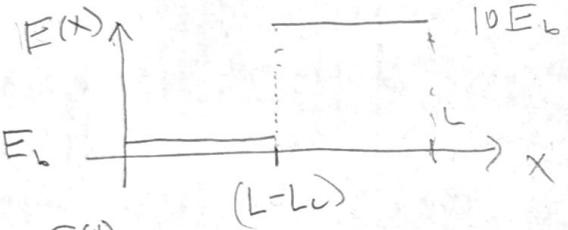


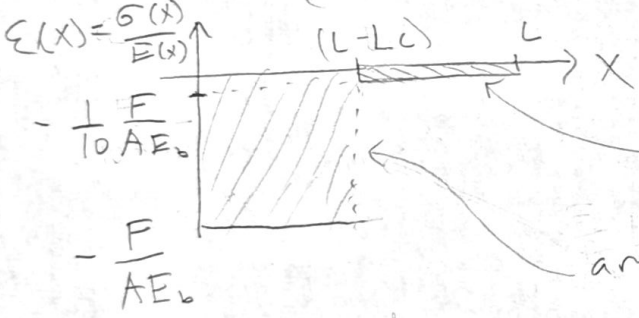
$E_c = 10 E_b$





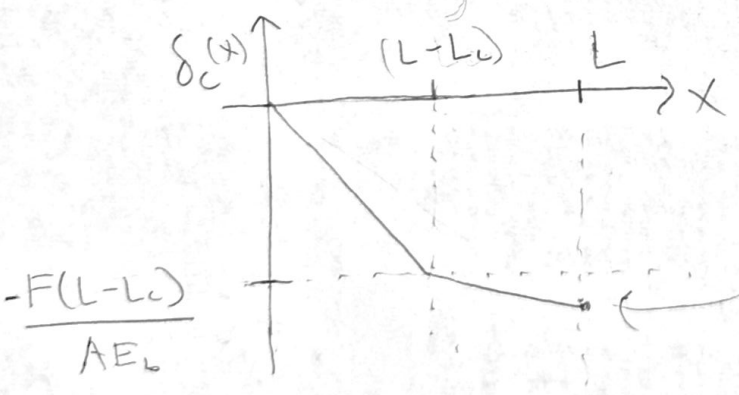






$$\text{area} = L_c\left(\frac{1}{10}\frac{F}{AE_c}\right)$$

$$\text{area} = (L-L_c)\frac{F}{AE_b}$$



$$\delta_{total} = -\frac{F(L-L_c)}{AE_b} - \frac{1}{10}\frac{FL_c}{AE_b}$$

solve for L_c

$$-\frac{AE_b\,\delta_{total}}{F} = L - L_c + \frac{1}{10}L_c$$

$$= L - \frac{9}{10}L_c$$

$$L_c = \frac{10}{9}\left(\frac{AE_b\,\delta_{total}}{F} + L\right)$$

$E_b = 8\,kPa = 8\times10^3\,Pa$

$A = 1\,cm^2 = 1\,cm^2 \cdot 10^{-4}\frac{m^2}{cm^2} = 10^{-4}\,m^2$

$L = 10\,cm = 10\cdot10^{-2}\,m = 10^{-1}\,m$

$P = 0.4\,N = 4\times10^{-1}\,N$

$$L_c = \frac{10}{9}\left(\frac{10^{-4}\cdot 8\times10^3}{4\times10^{-1}}\,\delta_{total} + 10^{-1}\right)$$

$$\boxed{L_c = \frac{1}{9}\left(20\,\delta_{total} + 1\right)}$$