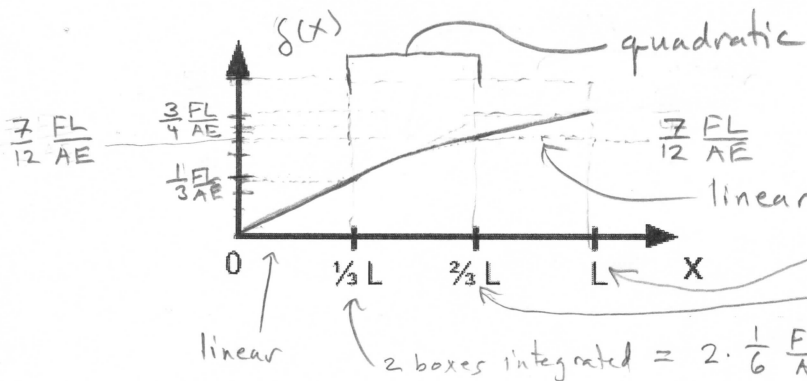
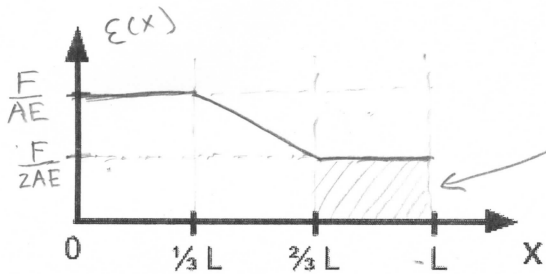
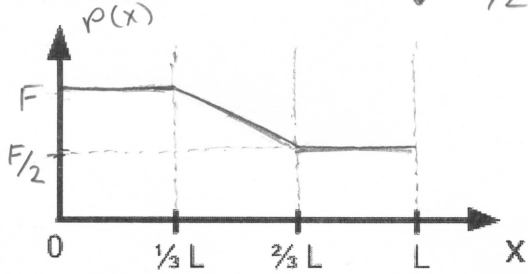
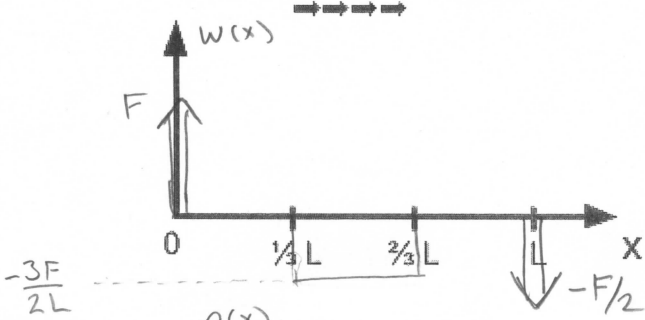
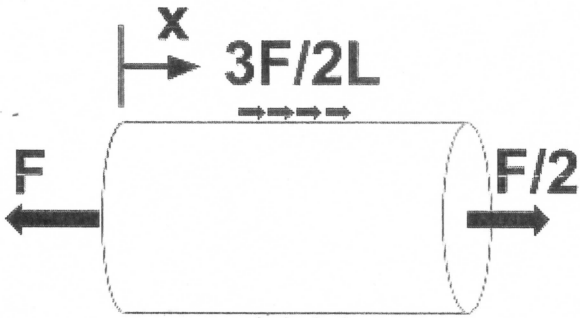


Problem 2 (20 points)

Draw and clearly label the following 5 graphs for the axially loaded object in terms of F , L , A , and E : 1) the applied distributed load; 2) the internal axial load; 3) the normal stress; 4) the normal strain; and 5) the deformation.

The graphs should model a cylindrical object of length L , as shown in the figure. There are concentrated forces of F at $x=0$ and of $F/2$ at $x=L$. There is also a uniform distributed force of $3F/2L$ N/m from $\frac{1}{3}L$ to $\frac{2}{3}L$. A is the area of the object's circular cross sections, and E is the Young's modulus of the object's material.



area of this box
 $\frac{F}{2AE} \cdot \frac{1}{3}L = \frac{1}{6} \frac{FL}{AE}$

$4\frac{1}{2}$ boxes integrated = $\frac{9}{2} \cdot \frac{1}{6} \frac{FL}{AE} = \frac{3}{4} \frac{FL}{AE}$

$3\frac{1}{2}$ boxes integrated = $\frac{7}{2} \cdot \frac{1}{6} \frac{FL}{AE}$

= $\frac{7}{12} \frac{FL}{AE}$

2 boxes integrated = $2 \cdot \frac{1}{6} \frac{FL}{AE} = \frac{1}{3} \frac{FL}{AE}$