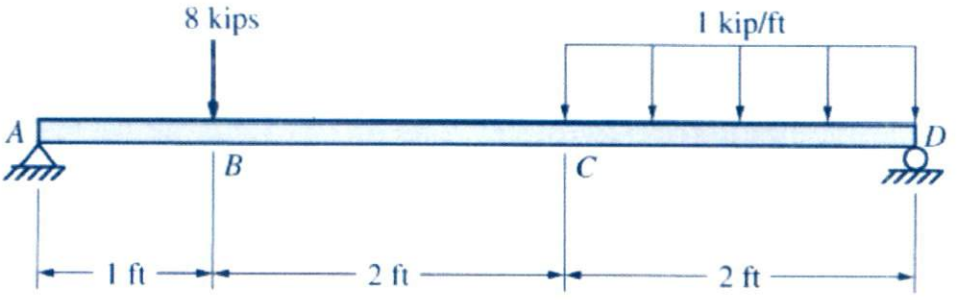
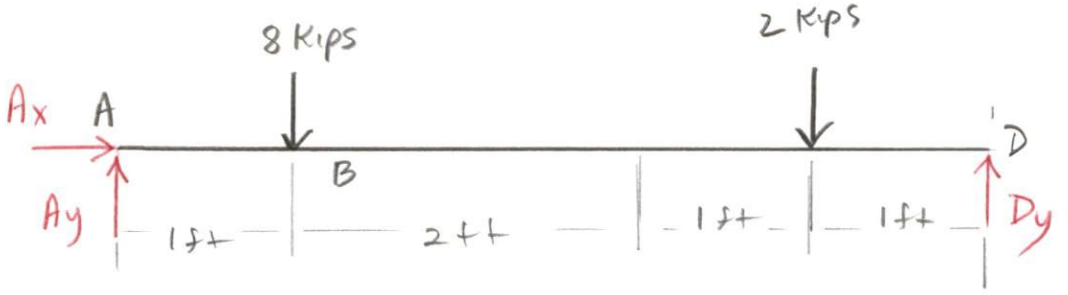
13-16

13-16 to 13-21 Refer to Figs. P13-16 to P13-21. Draw the shear force and bending moment diagrams for each beam. Locate the section with zero shear force (if any) and determine the moment at the section.



Solution.



FBD

Equilibrium Equations

$[\Sigma F_x = 0]$ $A_x = 0$

$[\Sigma M_A = 0]$ $-8\,\text{Kips}(1\,\text{ft}) - 2\,\text{kips}(4\,\text{ft}) + D_y(5\,\text{ft}) = 0$

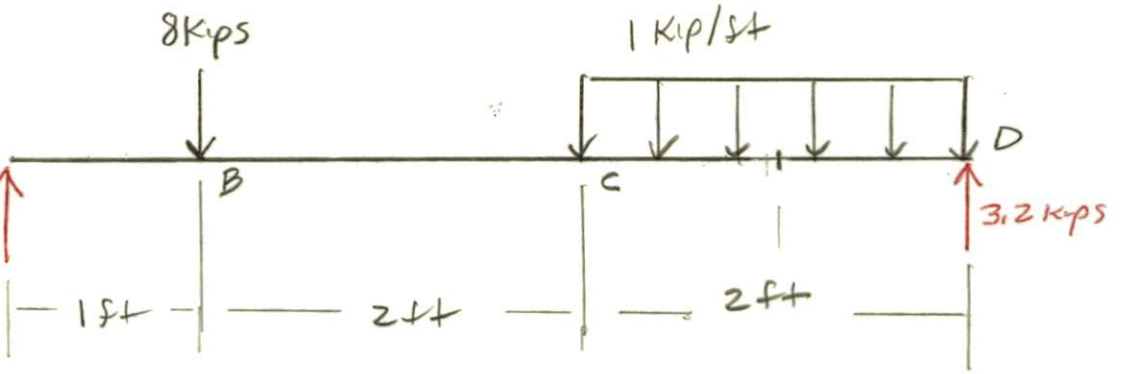
$D_y = \frac{16\,\text{Kip.ft}}{5\,\text{ft}} = 3.2\,\text{Kips}\ \uparrow$

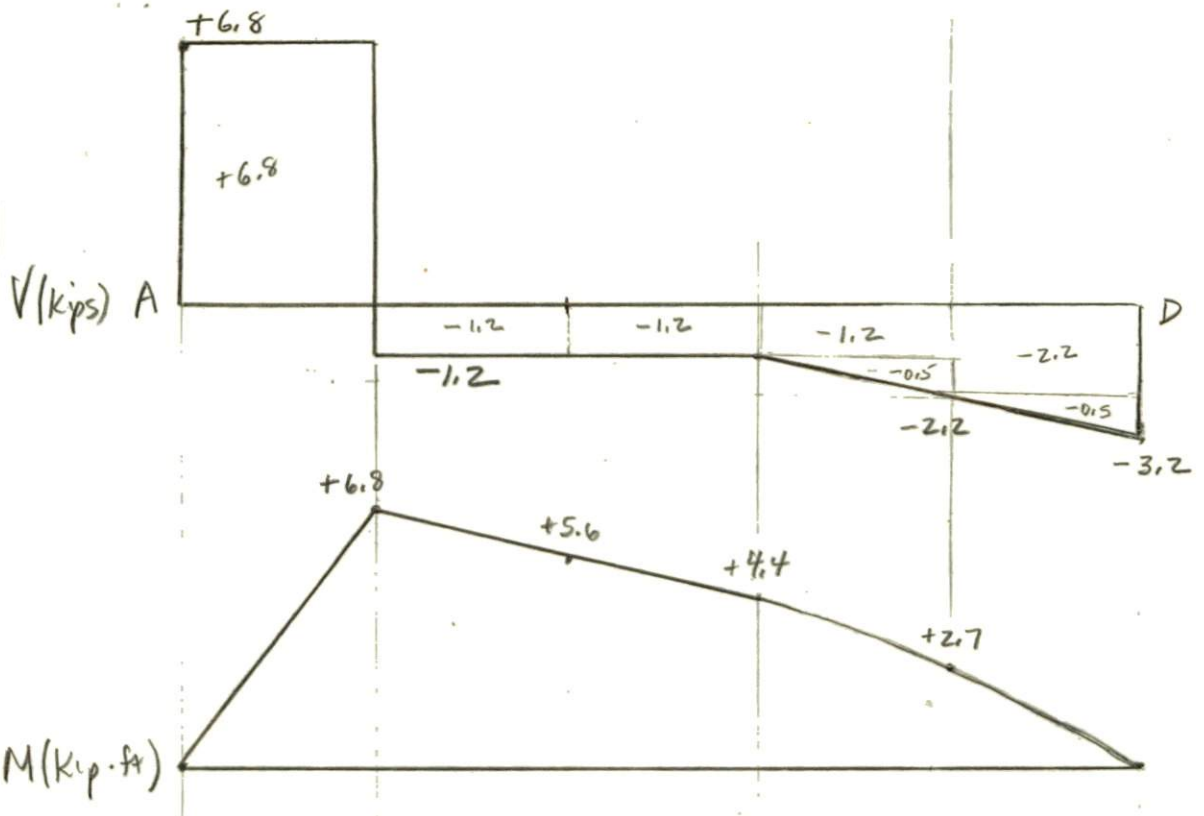
$[\Sigma F_y = 0]$ $A_y - 8\,\text{Kips} - 2\,\text{Kips} + D_y = 0$

$A_y = 10\,\text{Kips} - 3.2\,\text{Kips} = 6.8\,\text{Kips}\ \uparrow$

Shear and Moment Diagrams (next Page)

Loading Diagram





$-2.2(1) - \frac{1}{2}(1)(1)$

$-2.2 - .5 \quad -2.7$