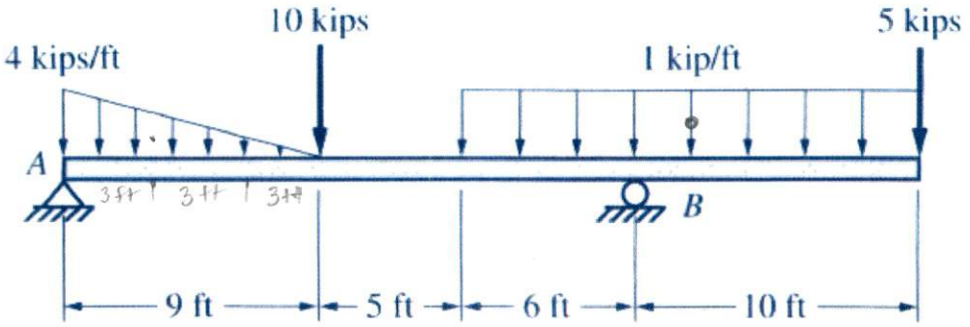
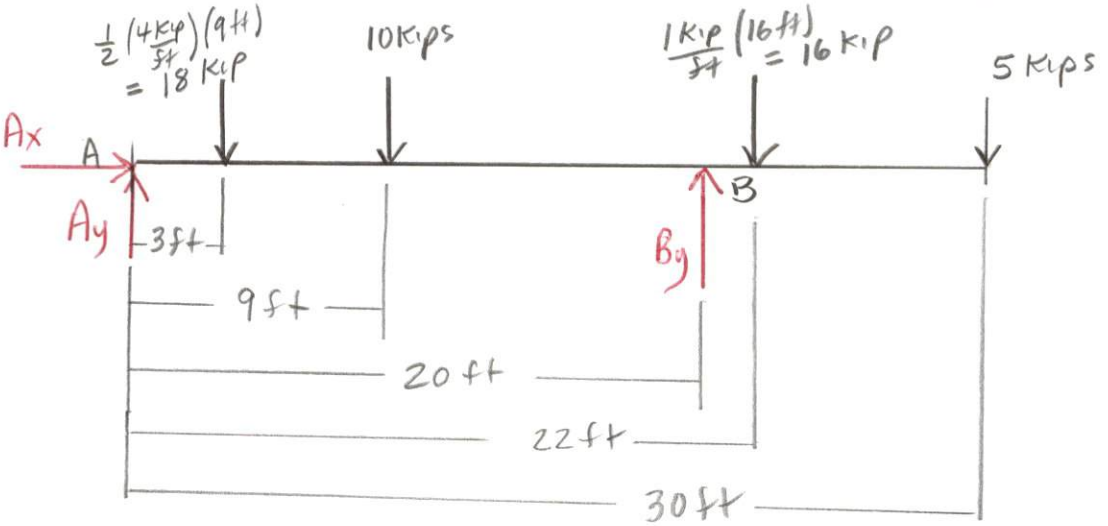
13-6

Determine the external reactions on each beam in Figs. P13-1 to P13-6 due to the loading shown.



Solution.



FBD

ccw +M ↺

cw −M ↻

Equilibrium Equations

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

$[\Sigma M_A = 0]$ $\quad -18\,kip(3ft) - 10\,kip(9ft) + B_y(20ft) - 16\,kip(22ft) - 5\,kip(30ft) =$

$$B_y = \frac{646\ kip\cdot ft}{20\ ft} = \underline{32.3\ kip} \uparrow$$

$[\Sigma F_y = 0]$ $\quad A_y - 18\,kip - 10\,kip + B_y - 16\,kip - 5\,kips = 0$

$$A_y = 49 - 32.3 = \underline{16.7\ kips} \uparrow$$