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Name: Solution

2. Construct the shear force and bending moment diagram for the beam due to the loading shown.

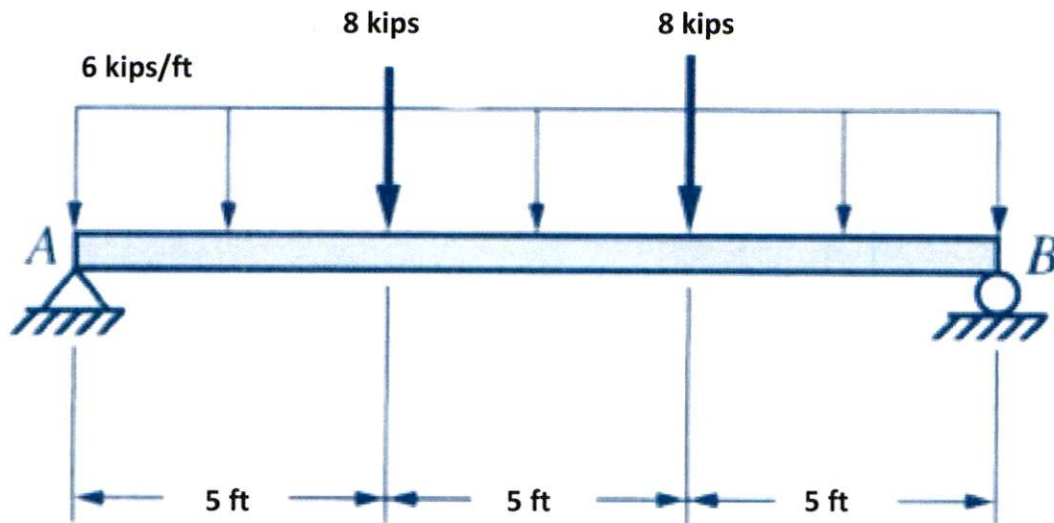


Table 13-1, case 3 and Case 4 By Superposition,

Case 3

$$A_y = B_y = P = 8 \text{ kips } \uparrow$$

$$|V_{\max}| = P = 8 \text{ kips}$$

$$M_{\max} = Pa = 8 \text{ kips } (5 \text{ ft}) = 40 \text{ kip}\cdot\text{ft}$$

Case 4

$$A_y = B_y = \frac{wL}{2} = \frac{6 \text{ kips/ft } (15 \text{ ft})}{2} = 45 \text{ kip } \uparrow$$

$$|V_{\max}| = \frac{wL}{2} = 45 \text{ kip}$$

$$M_{\max} = \frac{wL^2}{8} = \frac{6 \text{ kip/ft } (15 \text{ ft})^2}{8} = 168.75 \text{ kip}\cdot\text{ft}$$

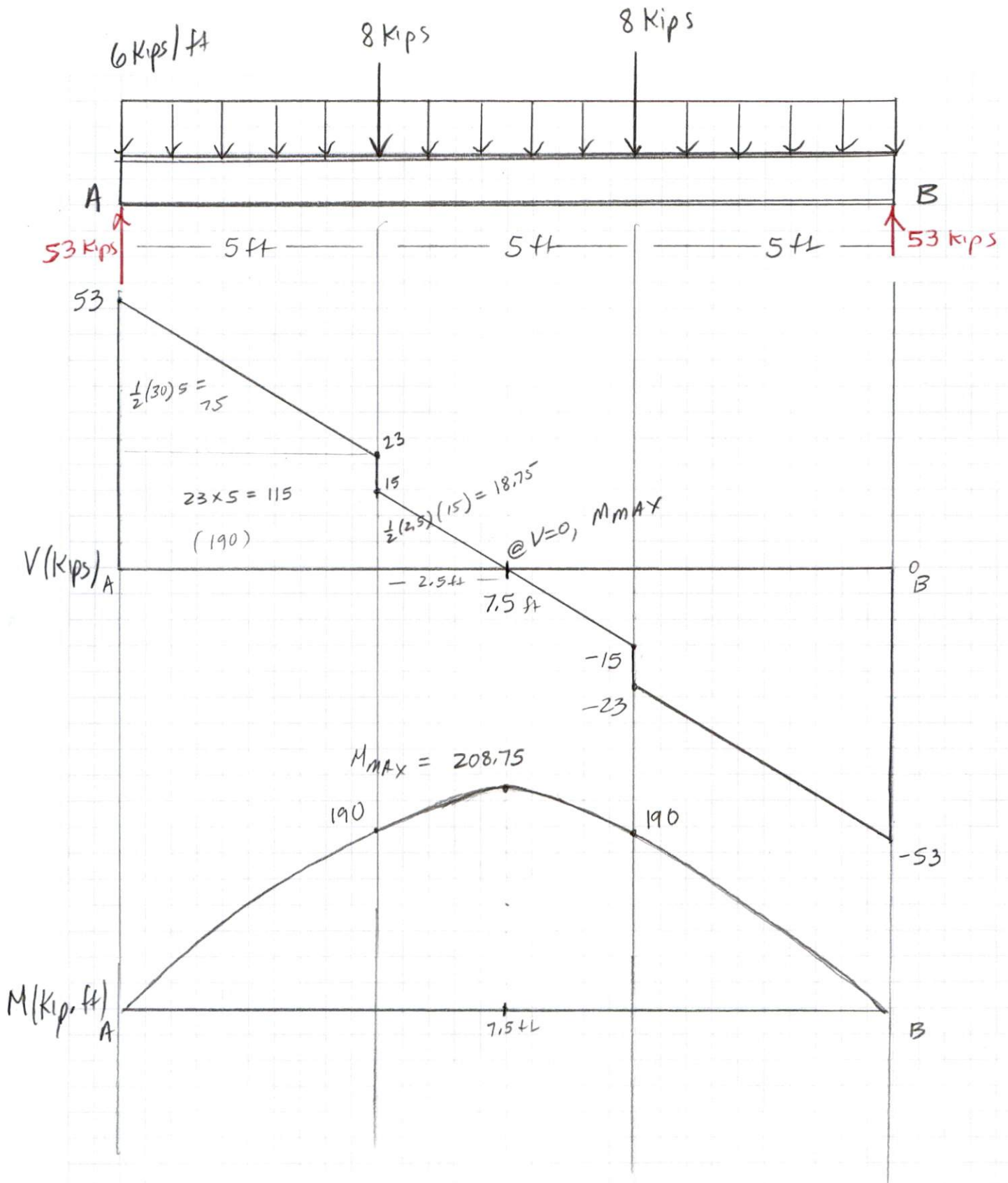
By Superposition,

$$A_y = 8 \text{ kip} + 45 \text{ kip} = 53 \text{ kip } \uparrow$$

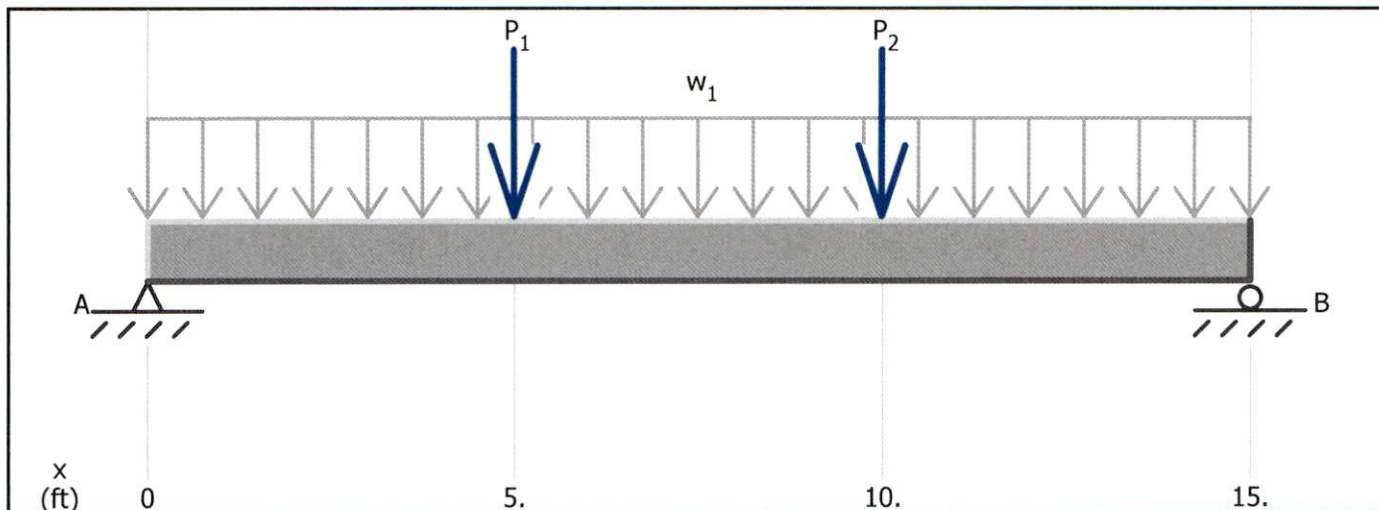
$$B_y = 8 \text{ kip} + 45 \text{ kip} = 53 \text{ kip } \uparrow$$

$$V_{\max} = 8 \text{ kip} + 45 \text{ kip} = 53 \text{ kip}$$

$$M_{\max} = 40 \text{ kip}\cdot\text{ft} + 168.75 \text{ kip}\cdot\text{ft} = 208.75 \text{ kip}\cdot\text{ft}$$



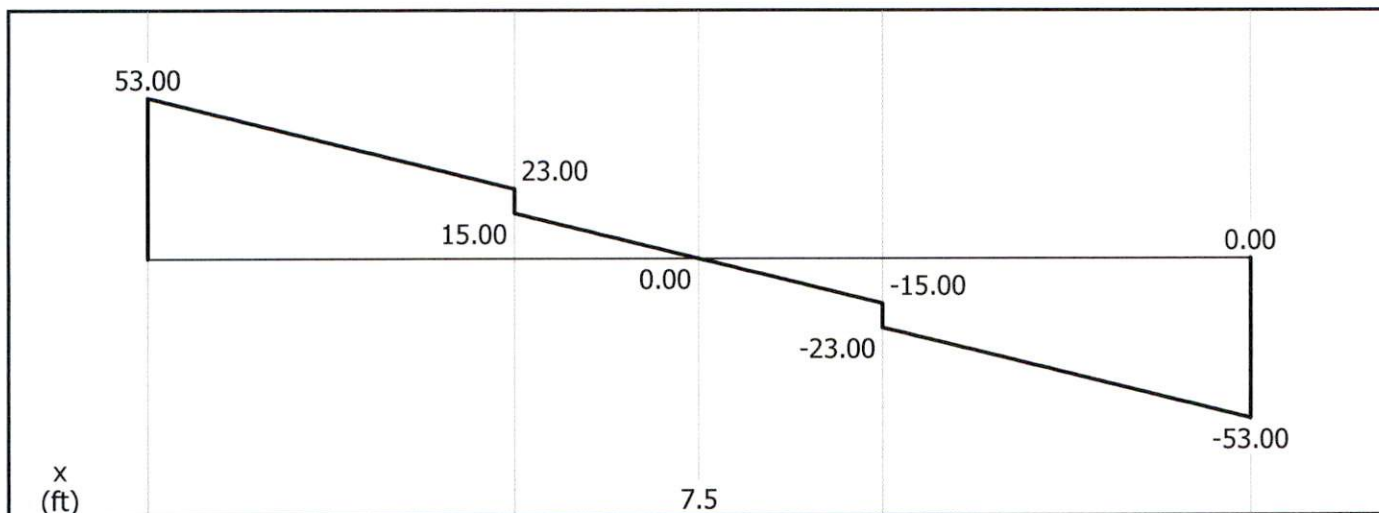
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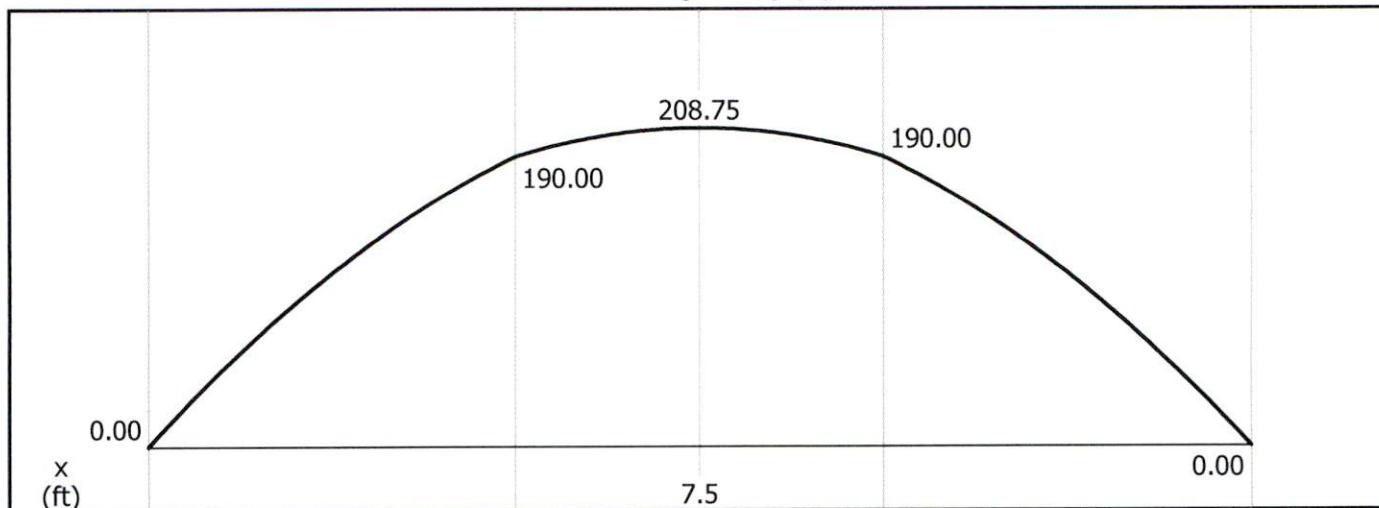
Load Diagram

$w_1 = 6.0$ kips/ft (down)
 $P_1 = 8.0$ kips (down)
 $P_2 = 8.0$ kips (down)

$A_y = 53.00$ kips (up)
 $B_y = 53.00$ kips (up)



Shear Diagram (kips)



Moment Diagram (kip-ft)