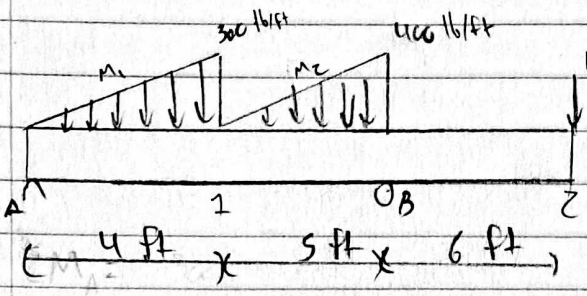
Solution - 21-5-7.3-MK-08



$$M_1 = \frac{-300-0}{4-0} = -75\ \text{lb/ft}^2$$

$$M_2 = \frac{-400-0}{5-0} = -80\ \text{lb/ft}^2$$

$$\Sigma M_A = (-300\ \text{lb/ft})(4\text{ ft})\left(\tfrac{1}{2}\right)(4\text{ ft})\left(\tfrac{2}{3}\right) + (-400\ \text{lb/ft})(5\text{ ft})\tfrac{1}{2}\left((5\text{ ft})\tfrac{2}{3} + 4\text{ ft}\right) + B_y(9\text{ ft}) - 1500\ \text{lb}(15\text{ ft})$$

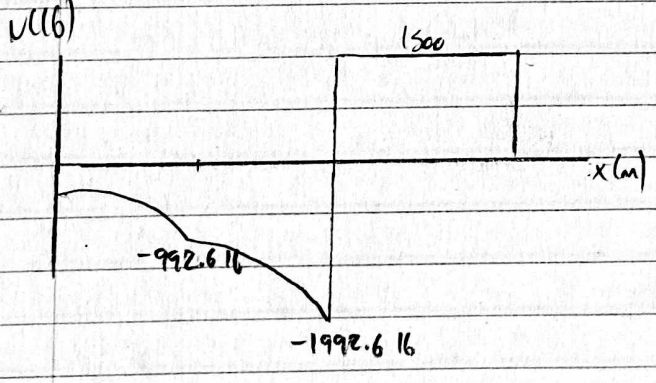
$$B_y = 3492.6\ \text{lb}$$

$$\Sigma M_B = -A_y(9\text{ ft}) + (300\ \text{lb/ft})(4\text{ ft})\tfrac{1}{2}\left((4\text{ ft})\tfrac{1}{3} + 5\text{ ft}\right) + (400\ \text{lb/ft})(5\text{ ft})\left[\tfrac{1}{2}(5\text{ ft})\tfrac{1}{3}\right) - (1500\ \text{lb})(6\text{ ft})$$

$$A_y = 392.6\ \text{lb} \downarrow$$

Check

$$\Sigma f_y = 3492.6 - 392.6 - 1500 - (400)(0.5)(5) - (300)(0.5)(4) = 0$$



$$V_A = -392.6$$

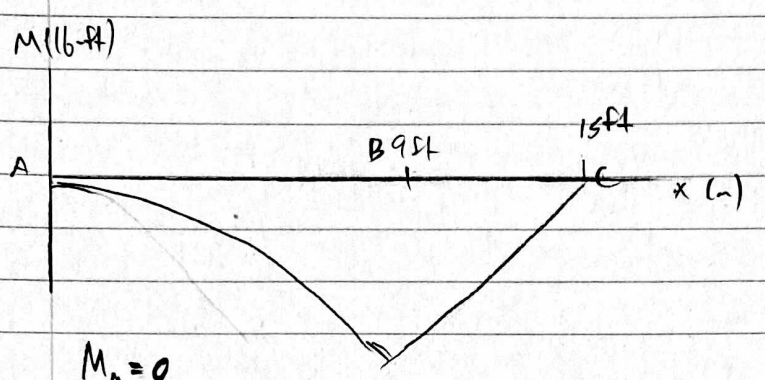
$$V_1 = -392.6 + \int -75x$$

$$V_1 = -392.6 - \frac{75x^2}{2} = -992.6\ \text{lb}$$

$$V_B = -992.6 + \int -80x \Rightarrow -992.6 - \frac{80x^2}{2} \Rightarrow V_{B_2} = -1992.6\ \text{lb}$$

$$V_{B_3} = -1992.6\text{lb} + 3492.6 = 1500$$

$$V_C = 1500 - 1500 = 0$$



$M_A = 0$

$M_B = 0 + \int -392.6 - \frac{75x^2}{2} \rightarrow -392.6x - \frac{75x^3}{6} \rightarrow -2368.15$

$M_B = -2368.5 + \int -992.6 - \frac{80x^2}{2} \rightarrow -3525.5 - 992.6x - \frac{80x^3}{6} \rightarrow -9000.16$

$M_C = -9000 + \int 1500 \rightarrow -9000 + 1500x \rightarrow 0$

find the max shear value

$V_{B\leftarrow}$ or $V_{B\rightarrow}$

max bending moment

M_B