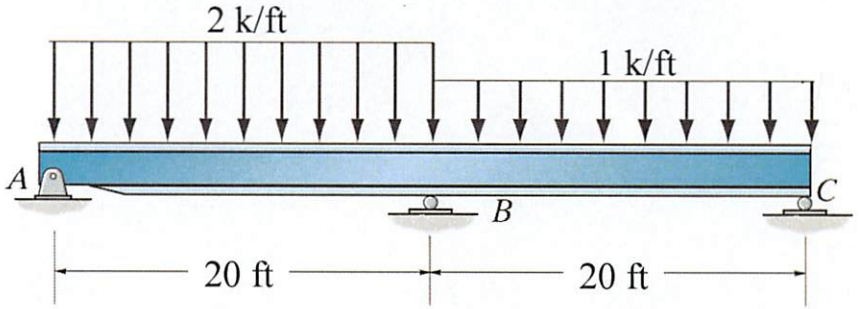
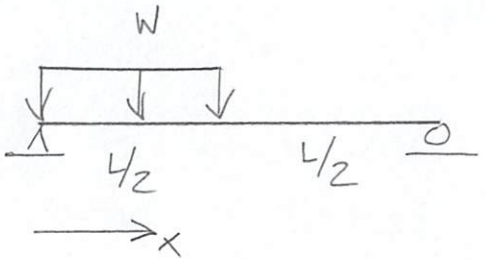
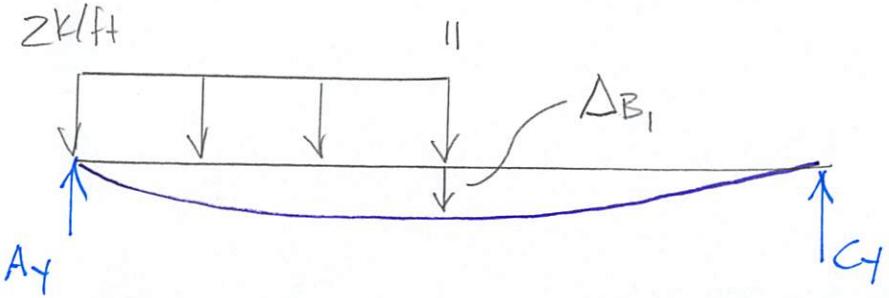
Problem 9a-3 – Compute the reactions and draw the shear and moment curves for the following beam.



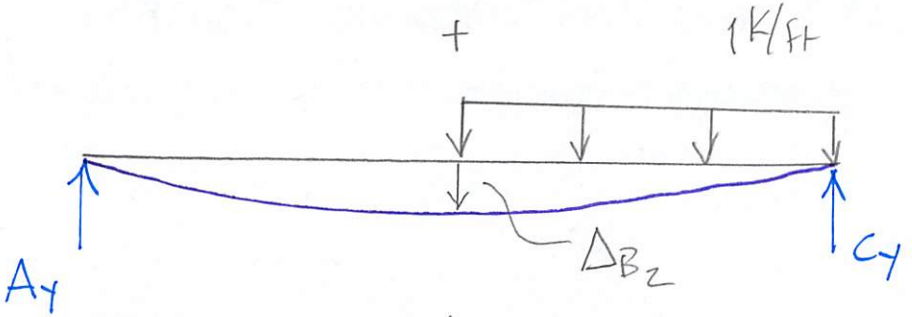


$$\Delta = \frac{Wx}{384EI}\left[16x^3 - 24Lx^2 + 9L^3\right]$$

$$= \frac{(-2k/ft)(20')}{384EI}\left[16(20')^3 - 24(40')(20')^2 + 9(40')^3\right]$$

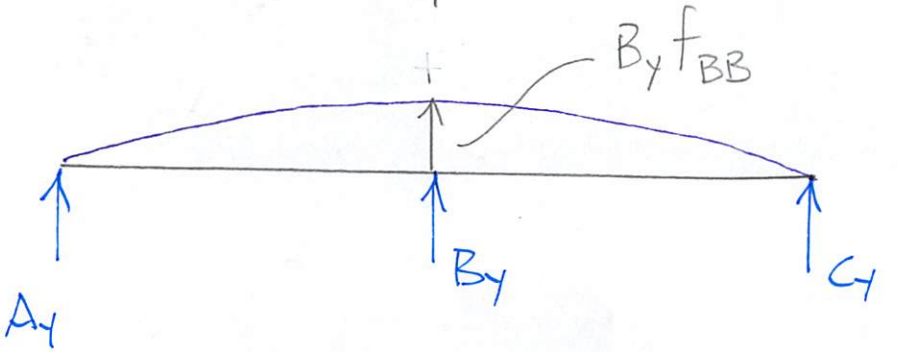


$$\Delta_{B_1} = -\frac{100{,}000\,k\,ft^3}{3EI}$$



$$\Delta_{B_2} = \Delta_{B_1}/2^*$$

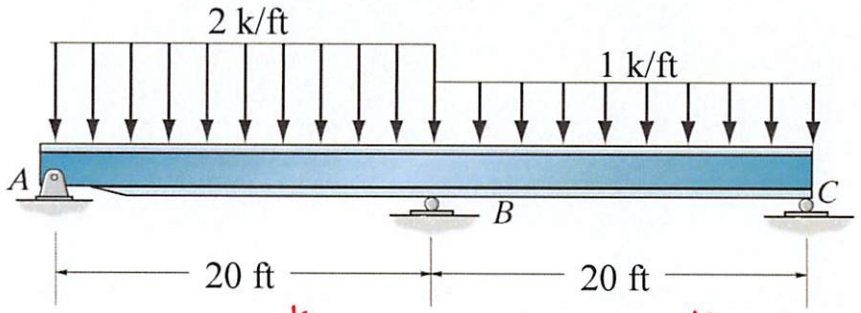
$$f_{BB} = \frac{L^3}{48EI} = \frac{(40')^3}{48EI} = \frac{4{,}000\,ft^3}{3EI}$$

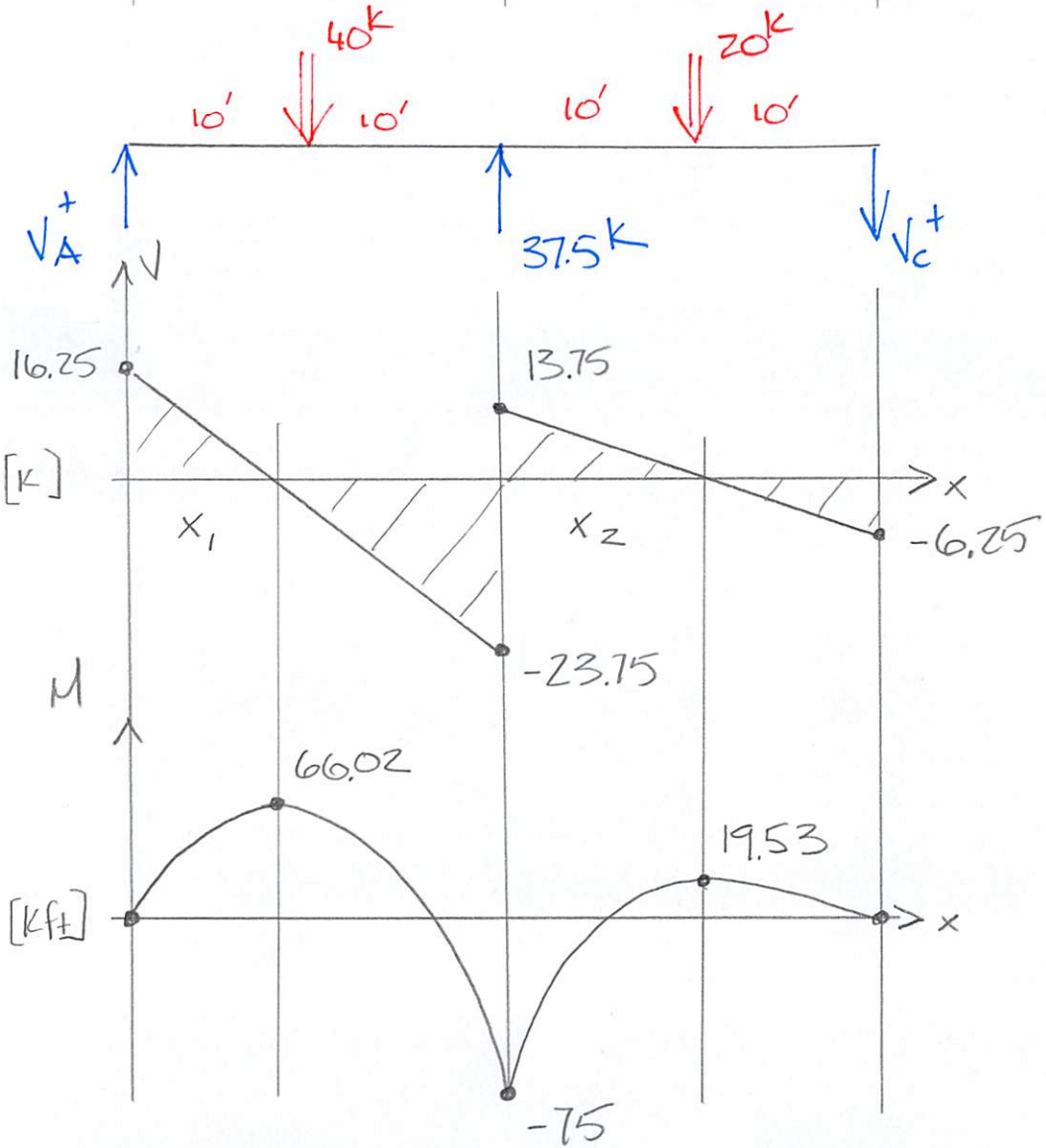


$$\Delta_{B_1} + \Delta_{B_1}/2 + B_y f_{BB} = 0$$

$$\underline{\underline{B_y = 37.5\,k}}$$

Problem 9a-3 – Compute the reactions and draw the shear and moment curves for the following beam.





$$\circlearrowleft^{+}\sum M_C = 0 = 20^k(10') + 40^k(30') - 37.5^k(20') - V_A(40')$$

$$\underline{\underline{V_A = 16.25k}}$$

$$+\uparrow \sum F_y = 0 = V_A - V_C + 37.5k - 20k - 40k$$

$$\underline{\underline{V_C = -6.25k}}$$

$$x_1 = \frac{16.25k}{2k/ft} = 8.125\,ft.$$

$$x_2 = \frac{13.75k}{1k/ft} = 13.75\,ft.$$

$$\underline{M_{MAX} = -75kft}$$