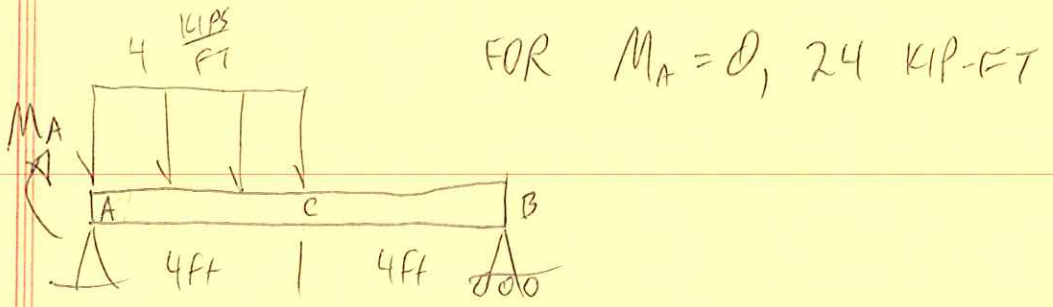
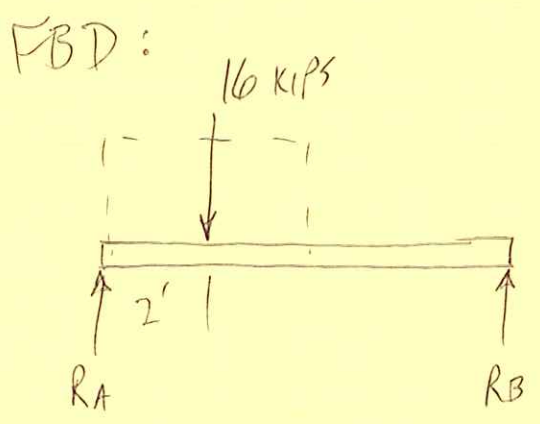


PROB. 7.80

DRAW SHEAR + BENDING -MOMENT DIAGRAMS, FIND MAXIMUMS.



FOR $M = 0$

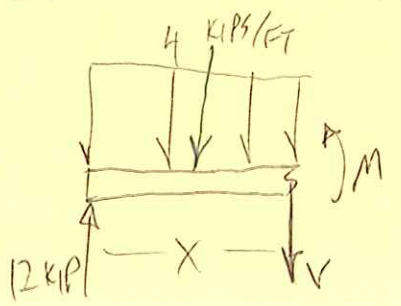


$$\sum M_A = 0 : + \uparrow \quad -(2 \text{ ft})(16 \text{ KIP}) + (8 \text{ ft})R_B = 0$$

$$R_B = 4 \text{ KIPS}$$

$$\sum F_y = 0 : R_A + R_B = 16, \quad R_A = 12 \text{ KIPS}$$

FBD BETWEEN A + C:



$$\sum F_y = 0 : 12 - 4x - V = 0$$

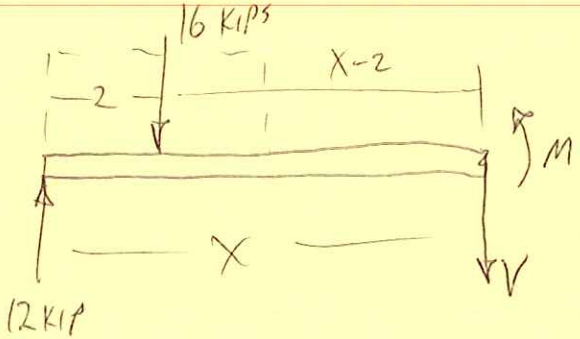
$$V = -4x + 12 \text{ KIPS}$$

PROB. 7.80

$$\sum M = 0 \uparrow: M + (4x)\left(\frac{1}{2}x\right) - 12x = 0$$

$$M = -2x^2 + 12x \text{ KIP-FT}$$

FBD BETWEEN C + B :



$$\sum F_y = 0: 12 - 16 - V = 0$$

$$V = -4 \text{ KIPS}$$

$$\sum M = 0 \uparrow: M + 16(x-2) - 12x = 0$$

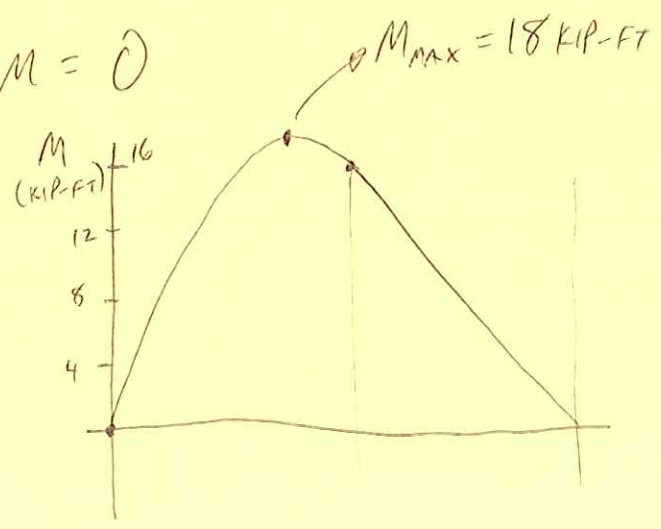
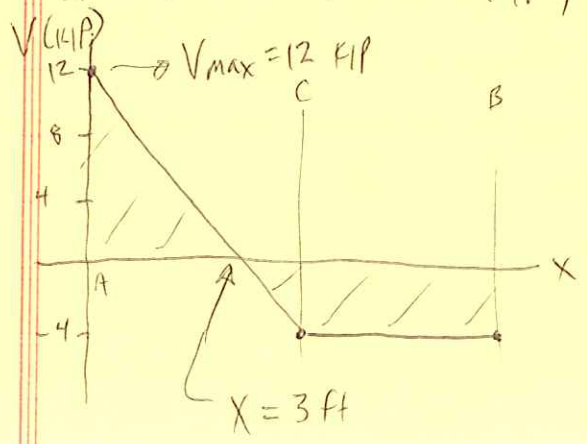
$$M = -4x + 32 \text{ KIP-FT}$$

$$x = 0^+: V = 12 \text{ KIP}, M = 0$$

$$x = 4^-: V = -4 \text{ KIP}, M = 16 \text{ KIP-FT}$$

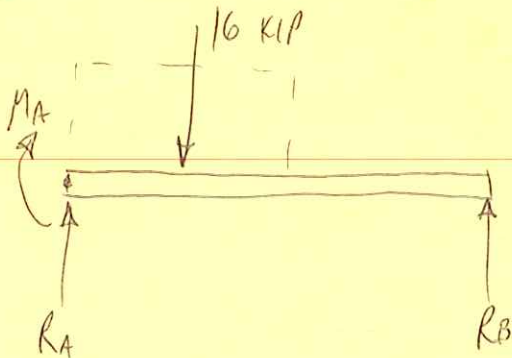
$$x = 4^+: V = -4 \text{ KIP}, M = 16 \text{ KIP-FT}$$

$$x = 8^-: V = -4 \text{ KIP}, M = 0$$



FOR $M_A = 24$ KIP-FT:

FBD:

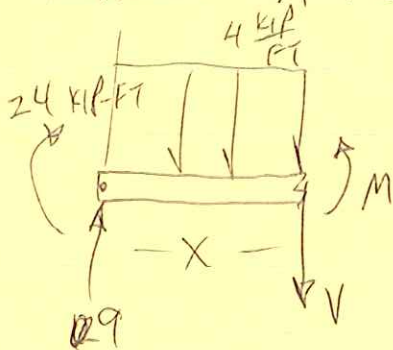


$$\sum M_A = 0 \quad \uparrow \curvearrowleft : -24 - (2\text{ft})(16\text{kip}) + (8\text{ft})R_B = 0$$

$$R_B = 7\text{ kips}$$

$$\sum F_y = 0 : R_A + R_B - 16 = 0, \quad R_A = 9\text{ kips}$$

FBD BETWEEN A + C:



$$\sum F_y = 0 : 9 - 4x - V = 0$$

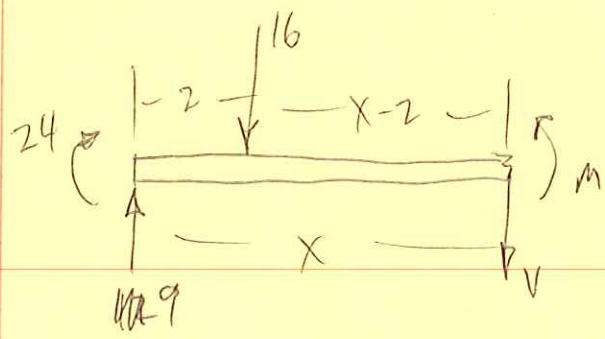
$$V = -4x + 9$$

$$\sum M = 0 \quad \uparrow \curvearrowleft : M + (4x)\left(\frac{1}{2}x\right) - 24 - 9x = 0$$

$$M = -2x^2 + 9x + 24$$

PROB. 7.80

FBD BETWEEN C + B :



$$\sum F_y = 0 : 9 - 16 - V = 0$$

$$V = -7 \text{ KIPS}$$

$$\sum M = 0 \uparrow : M + 16(x-2) - 9x - 24 = 0$$

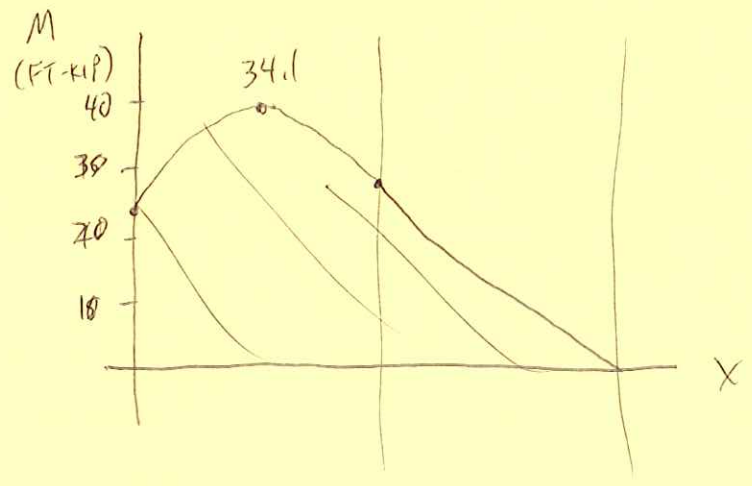
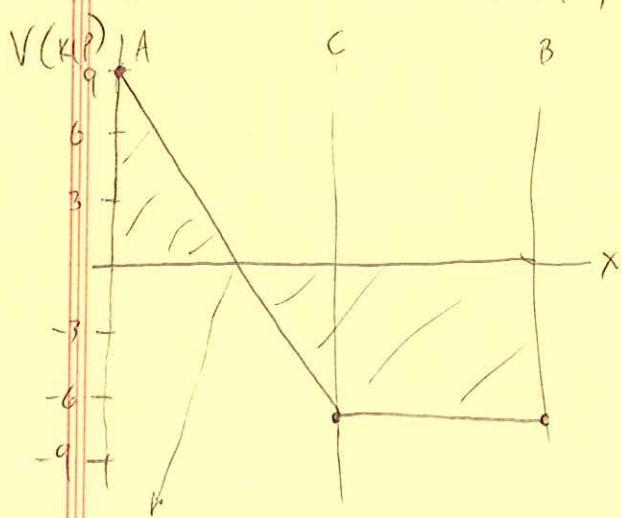
$$M = -7x + 56 \text{ KIP-FT}$$

$$x = 0^+ : V = 9 \text{ KIP} , M = 24 \text{ FT-KIP}$$

$$x = 4^- : V = -7 \text{ KIP} , M = 28 \text{ FT-KIP}$$

$$x = 4^+ : V = -7 \text{ KIP} , M = 28 \text{ FT-KIP}$$

$$x = 8^- : V = -7 \text{ KIP} , M = 0$$



$$V = 0 @ x = \frac{9}{4}$$

$$@ x = \frac{9}{4} , M = 34.1 \text{ FT-KIP}$$