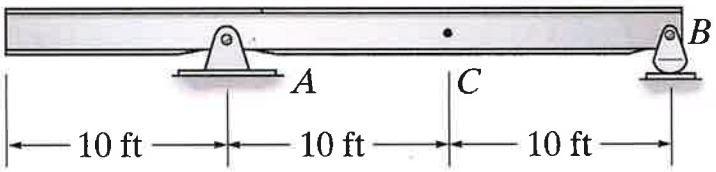
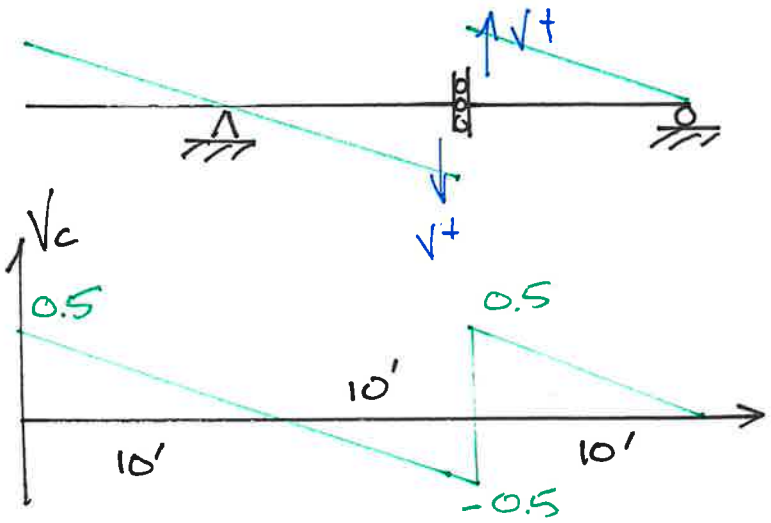
Example 6b-3: The beam supports a uniform dead load of 300 lb/ft, a uniform live load of 600 lb/ft, and a single live concentrated force of 20 k. Determine (a) the maximum positive moment at *C*, and (b) the maximum positive shear at *C*.





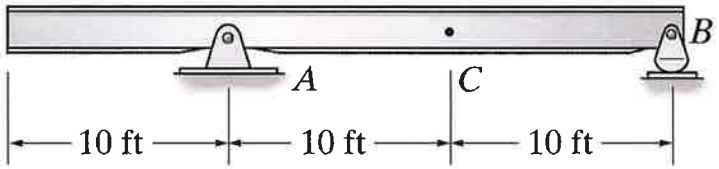
CONCENTRATED LIVE LOAD $20k(0.5) = 10k$

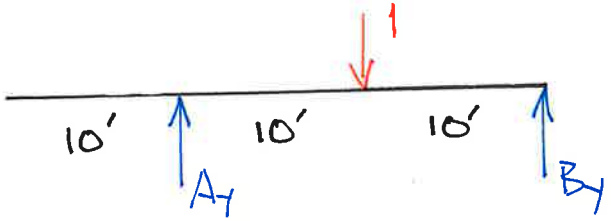
UNIFORM DEAD LOAD $0.3k/ft\left(\frac{1}{2}\right)\left[10'(0.5) + 10'(-0.5) + 10'(0.5)\right] = 0.75k$

UNIFORM LIVE LOAD $0.6k/ft\left(\frac{1}{2}\right)\left[10'(0.5) + 10'(0.5)\right] = 3k$

$$V_{c_{MAX}}^{+} = 13.75k$$

Example 6b-3: The beam supports a uniform dead load of 300 lb/ft, a uniform live load of 600 lb/ft, and a single live concentrated force of 20 k. Determine (a) the maximum positive moment at *C*, and (b) the maximum positive shear at *C*.

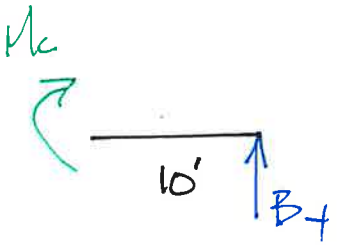




$$\circlearrowleft + \sum M_A = 0$$

$$= -1(10') + B_y(20')$$

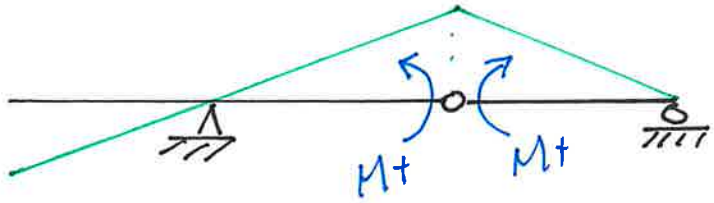
$$B_y = 1/2$$

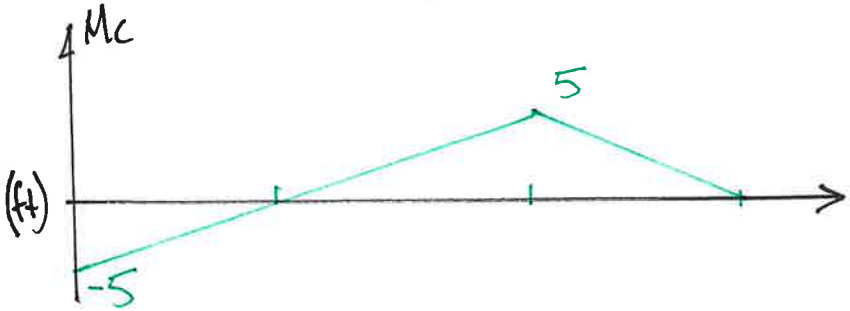


$$\circlearrowleft + \sum M_{CUT} = 0$$

$$= -M_c + B_y(10')$$

$$M_c = 5'$$





CONCENTRATE LIVE LOAD $20k(5ft) = 100kft$

UNIFORM DEAD LOAD $0.3k/ft\left(\frac{1}{2}\right)\left[10'(-5') + 20'(5')\right] = 7.5kft$

UNIFORM LIVE LOAD $0.6k/ft\left(\frac{1}{2}\right)20'(5') = 30kft$

$$M_{c_{MAX}}^{+} = 137.5kft$$