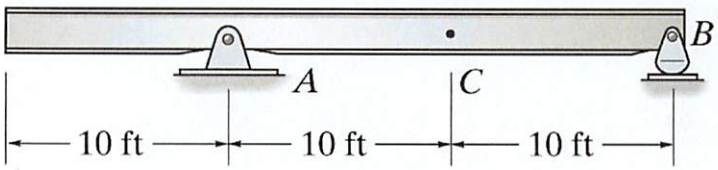
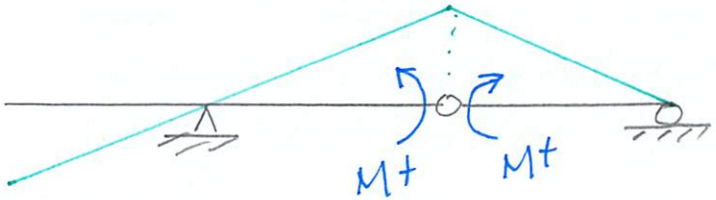
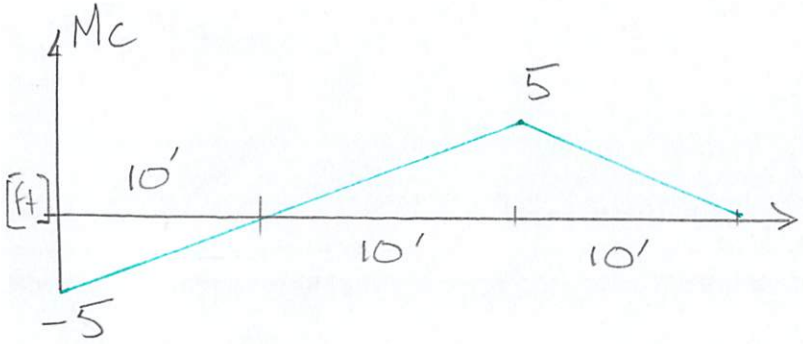
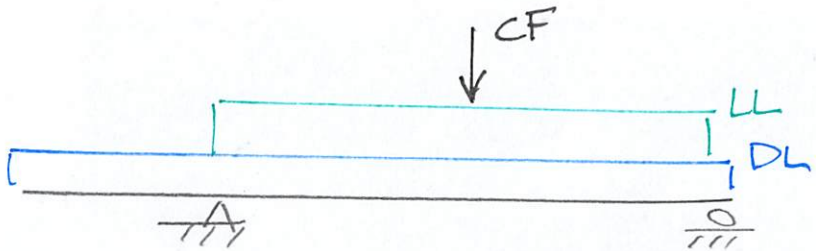
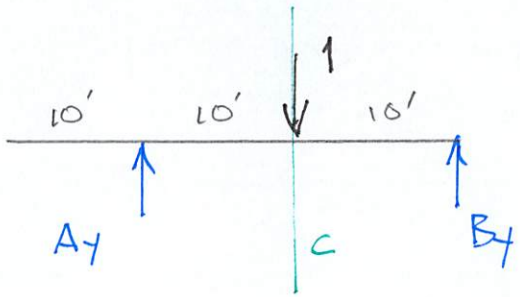
Example 6b-3: The beam supports a uniform dead load of 300 lb/ft, a uniform live load of 600 lb/ft, and a single live concentrated force of 20 k. Determine (a) the maximum positive moment at *C* and (b) the maximum positive shear at *C*.





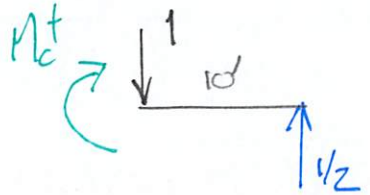






$\circlearrowleft \Sigma M_A = 0 = -1(10') + B_y(20')$

$B_y = 1/2$



$\circlearrowleft \Sigma M_c = 0 = -M_c + 1/2(10')$

$M_c = 5\,ft$

$M^+_{c_{MAX}} = 20k(5ft)$ CONCENTRATED FORCE

DEAD UNIFORM LOAD

$+ 0.3k/ft\left(\frac{1}{2}\right)\left[10'(-5') + 20'(5')\right]$

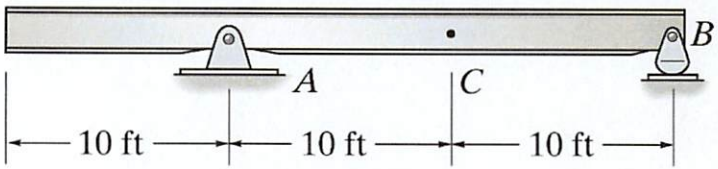
LIVE UNIFORM LOAD

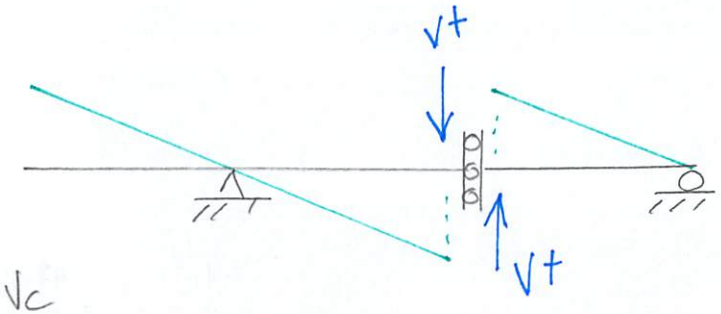
$+ 0.6k/ft\left(\frac{1}{2}\right)20'(5')$

$= [100 + 7.5 + 30]\,k\,ft$

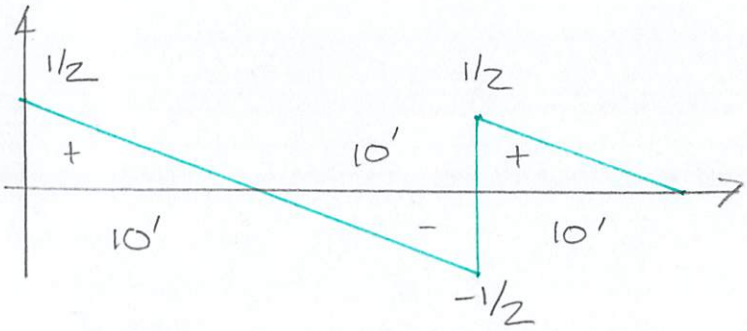
$= 137.5\,k\,ft$

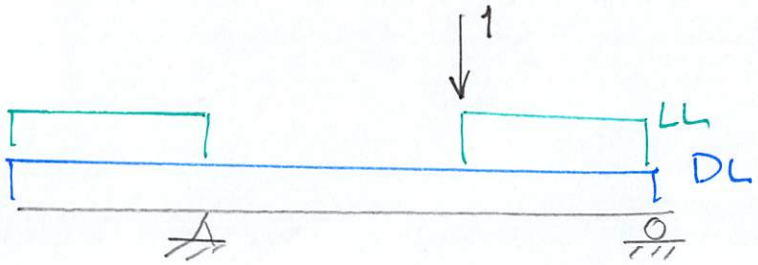
Example 6b-3: The beam supports a uniform dead load of 300 lb/ft, a uniform live load of 600 lb/ft, and a single live concentrated force of 20 k. Determine (a) the maximum positive moment at *C* and (b) the maximum positive shear at *C*.





V_C





$$V_{C_{MAX}}^{+} = 20k(1/2) \quad \text{CONCENTRATED FORCE}$$

DEAD UNIFORM LOAD

$$+ 0.3k/ft\left(\tfrac{1}{2}\right)\left[10'(1/2) + 10'(1/2) + 10'(1/2)\right]$$

LIVE UNIFORM LOAD

$$+ 0.6k/ft\left(\tfrac{1}{2}\right)\left[10'(1/2) + 10'(1/2)\right]$$

$$= [10 + 0.75 + 3]\,kN$$

$$= \underline{13.75kN}$$