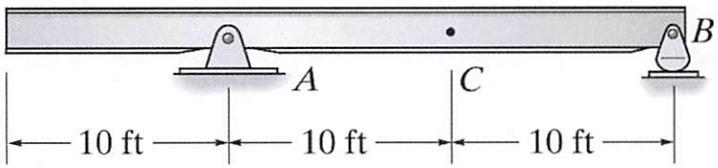
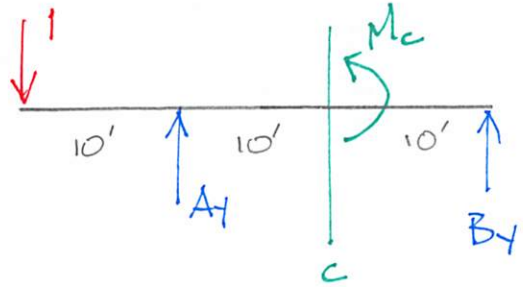
Example 6b-3: The beam supports a uniform dead load of 300 lb/ft, a uniform live load of 600 lb/ft, and a single live concentrated force of 20 k. Determine (a) the maximum positive moment at *C* and (b) the maximum positive shear at *C*.





$\circlearrowleft \Sigma M_B = 0$

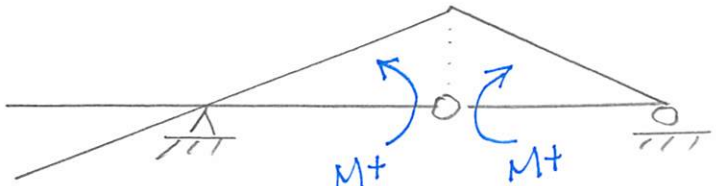
$= 1(30') - A_y(20')$

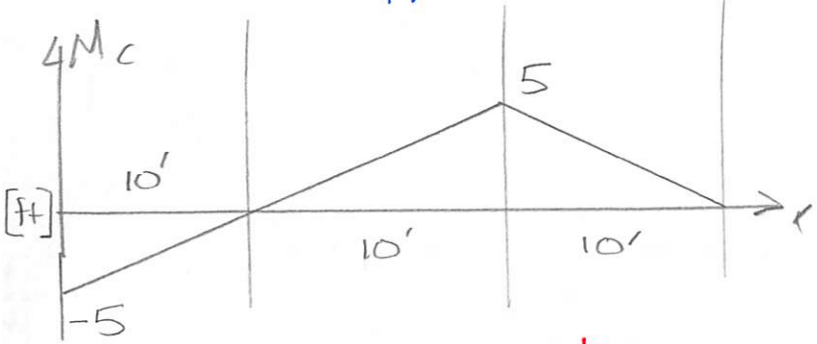
$A_y = 1\frac{1}{2}$

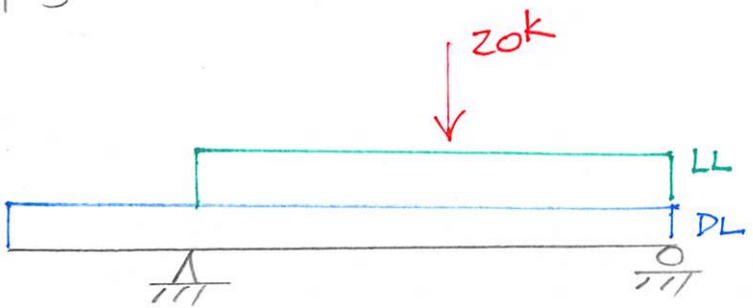
$\circlearrowleft \Sigma M_{cut} = 0$

$= M_c - A_y(10') + 1(20')$

$M_c = -5\,ft$







LIVE FORCE

$20k(5ft) = 100kft$

DEAD UNIFORM LOAD

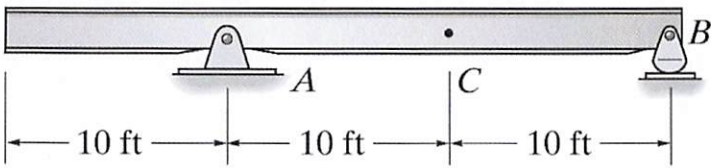
$(0.3k/ft)\left(\frac{1}{2}\right)\left[10'(-5') + 20'(5')\right] = 7.5kft$ *

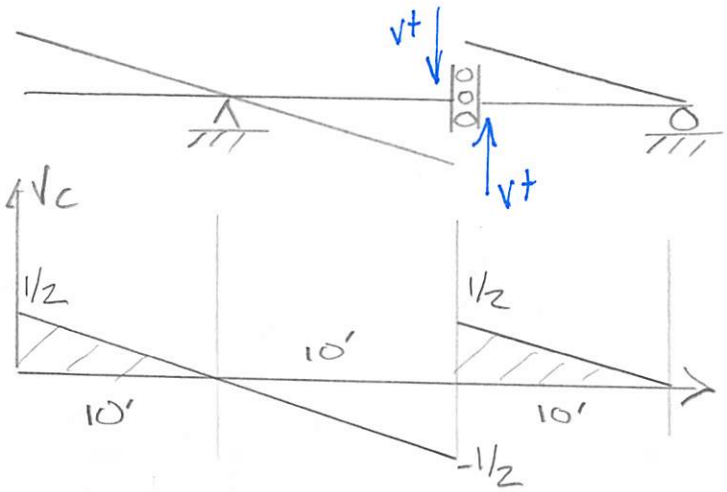
LIVE UNIFORM LOAD

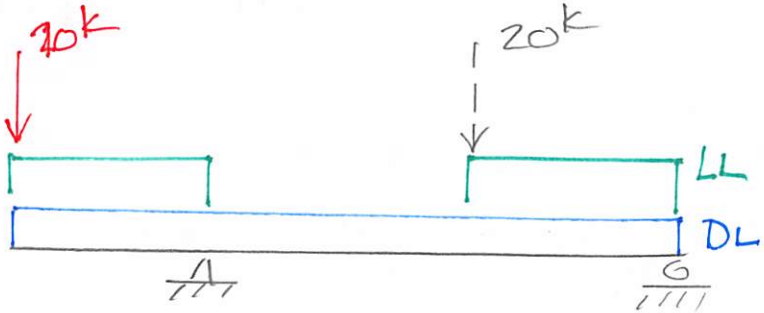
$(0.6k/ft)(1/2)(20')(5') = 30kft$ *

$M_c = 137.5kft$

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*.







LIVE FORCE

$20^k(1/2) = 10^k$ *

DEAD UNIFORM LOAD

$0.3k/ft(1/2)\left[10'(1/2) + 10'(-1/2) + 10'(1/2)\right] = \underline{0.75^k}$ *

LIVE UNIFORM LOAD

$0.6k/ft(\tfrac{1}{2})\left[10'(1/2) + 10'(1/2)\right] = \underline{3^k}$ *

$V_c = 13.75^k$