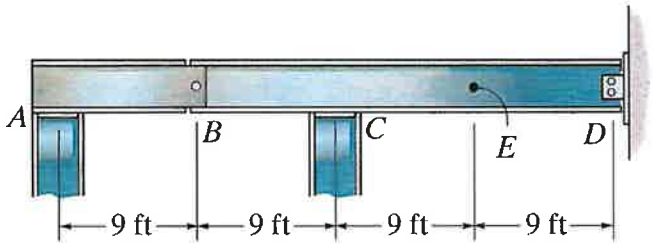
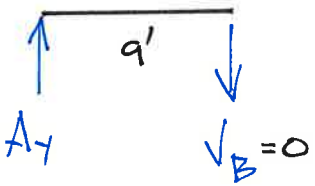
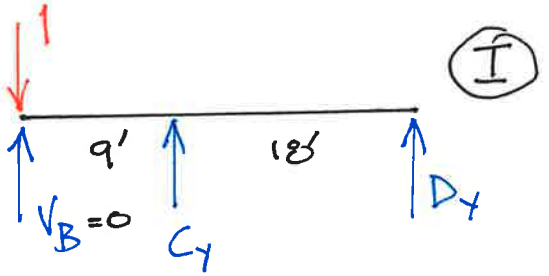
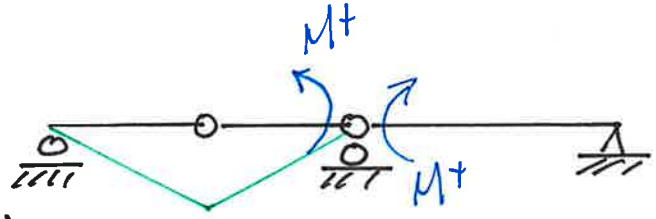
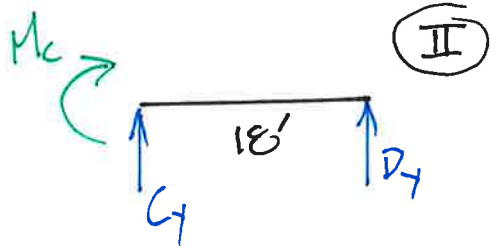
Example 6b-5: The beam supports a uniform dead load of 200 lb/ft, a uniform live load of 400 lb/ft, and a single live concentrated force of 10 k. Determine (a) the maximum ~~positive~~ moment at *C*, and (b) the maximum positive shear at *E*.

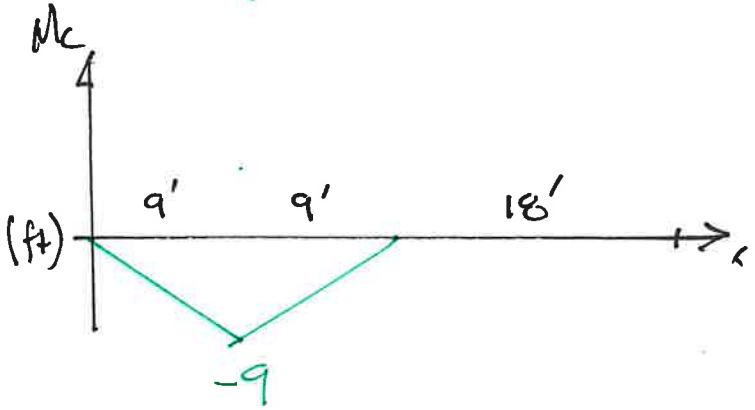












(I) $\circlearrowleft \sum M_c = 0 = 1(9') + D_y(18')$ $\quad D_y = -1/2$

(II) $\circlearrowleft \sum M_{CUT} = 0 = -M_c + D_y(18')$

$M_c = -9$ ft

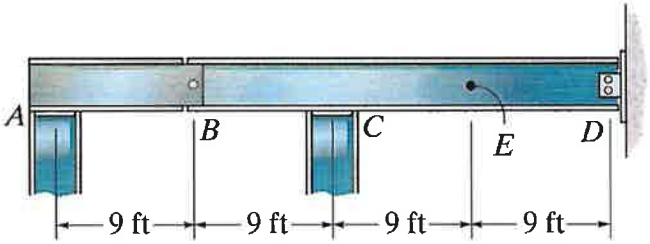
LIVE FORCE $10^k(-9') = -90^k$ft

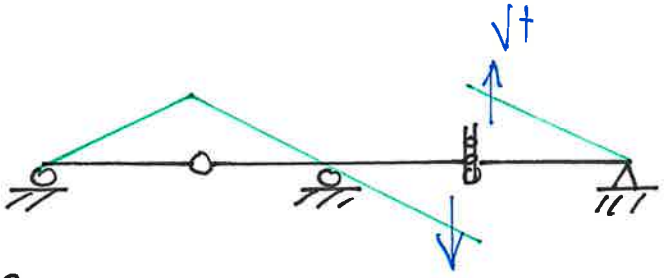
UNIFORM DEAD LOAD $0.2^k/ft\,(\frac{1}{2})\,18'(-9') = +16.2^k$ft

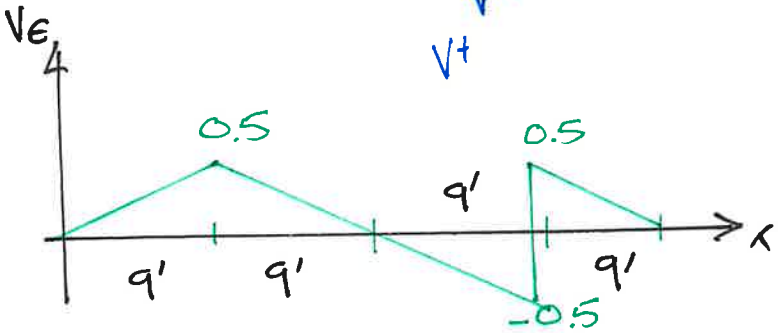
UNIFORM LIVE LOAD $0.4^k/ft\,(\frac{1}{2})\,18'(-9') = -32.4^k$ft

$M_{c_{MAX}} = -138.6^k$ft

Example 6b-5: The beam supports a uniform dead load of 200 lb/ft, a uniform live load of 600 lb/ft, and a single live concentrated force of 10 k. Determine (a) the maximum positive moment at *C*, and (b) the maximum positive shear at *E*.







$V^{+}_{E_{MAX}} = 8.6k$

LIVE LOAD $10^k(0.5) = 5k$

UNIFORM DEAD LOAD $0.2k/ft\left(\frac{1}{2}\right)[18'(0.5) + 9(-0.5) + 9'(0.5)] = 0.9k$

UNIFORM LIVE LOAD $0.4k/ft\left(\frac{1}{2}\right)[18'(0.5) + 9'(0.5)] = 2.7k$