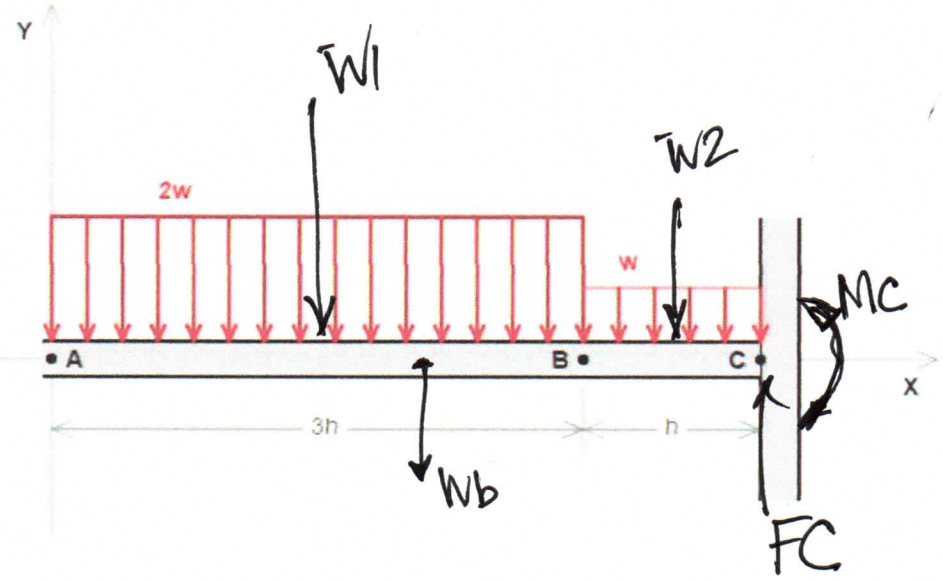
SOLUTION

ip4STATICS Worksheet for U04_P12

A cantilever beam carries two uniformly-distributed loadings, as shown below. The weight of the uniform beam between A and C is Wb.

Instance variables: force Wb in lbs, load w in lb/ft, length h in ft.



(1) What is the reaction force FC at C in equilibrium? ('mag,deg')

(2) What is the reaction moment MC in equilibrium? (Use ccw:+,cw:-)

shifting x origin to C —

$W1 = (2w)(3h)$; $xW1 = -h - \frac{3h}{2} = -\frac{5}{2}h$

$W2 = (w)(h)$; $xW2 = -\frac{h}{2}$.

$xWb = -2h$

(1) $|Fc| = W1 + W2 + Wb$

$\angle Fc = 90°$

(2) $MC = \left(-\frac{5}{2}h\right)W1 + \left(-\frac{h}{2}\right)W2 + (-2h)Wb$

Negative means cw direction in figure.