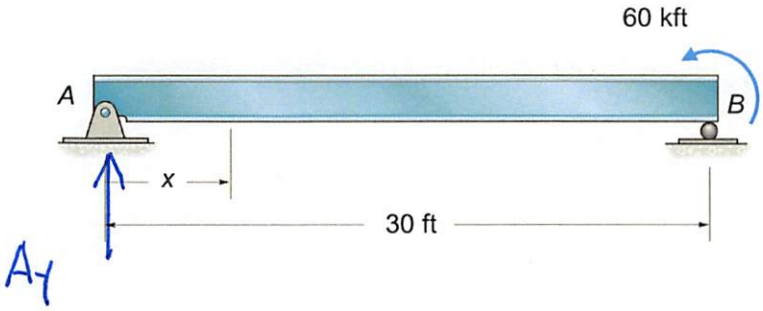
CIVL 3121 Quiz #6 S26 Name: _____

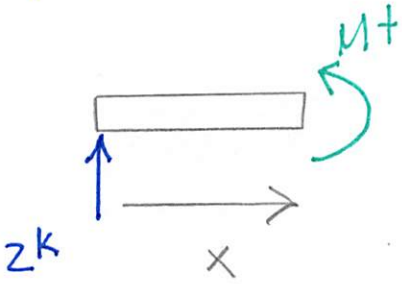
Determine the equation of the elastic curve for the beam using the x coordinate valid for $0 \le x \le 30$ ft. Assume EI is constant.



A_y

$\circlearrowleft + \sum M_B = 0 = 60\,k\text{-}ft - A_y(30\,ft)$

$A_y = 2^k$



$\circlearrowleft + \sum M_{cut} = 0 = M - 2^k(x)$ $\quad M(x) = (2x)\,k\text{-}ft$

$$EI\theta = \int M\,dx = x^2 + C_1$$

$$y = \int \theta\,dx = \frac{1}{EI}\left[\frac{x^3}{3} + C_1 x + C_2\right]$$

$y(x=0) = 0 = C_2$

$y(x=30\,ft) = 0 = 9{,}000 + 30C_1$

$C_1 = -300\,ft^2$

$$y(x) = \frac{1}{EI}\left[\frac{x^3}{3} - 300x\right]\,ft$$

M_{MAX} @ $V = 0 = x^2 - 300 \Rightarrow x^2 = 300$

$x = 17.32\,ft$