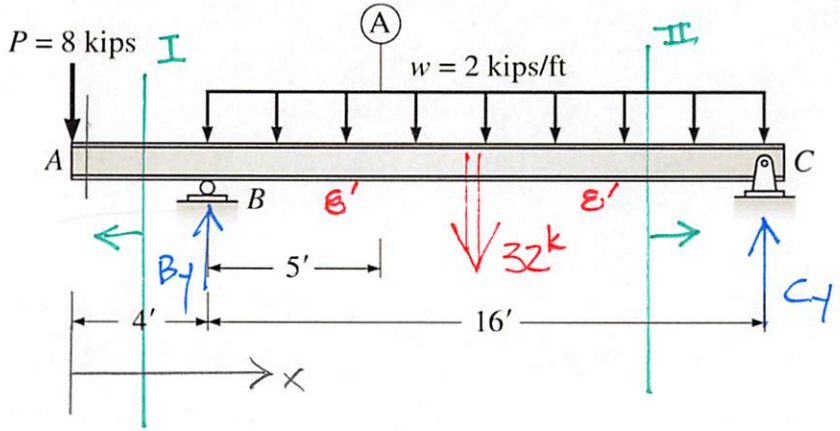
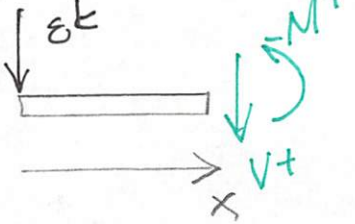
Example 4b-4 - Determine the internal shear and bending moment as a function of ***x***.



$$\circlearrowleft + \Sigma M_B = 0 = 8^k(4') - 32^k(8') + C_y(16')$$

$$C_y = 14^k$$

(I) $0 \le x \le 4$



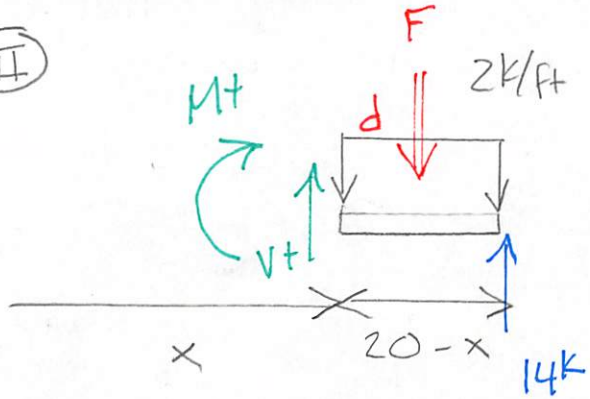
$$\circlearrowleft + \Sigma M_{cut} = 0 = M + 8x$$

$$M_I = [-8x]\ k\,ft \qquad M(x=0) = 0 \ \checkmark$$

$$+\uparrow \Sigma F_y = 0 = -V - 8^k$$

$$V_I = -8^k \qquad \frac{dM}{dx} = V \ \checkmark$$

(II)



F d

$$\circlearrowleft + \Sigma M_{cut} = 0 = -M - 2(20-x)\left(\frac{20-x}{2}\right) + 14(20-x)$$

$$M = [-(20-x)^2 + 14(20-x)]\ k\,ft \qquad M(x=20) = 0 \ \checkmark$$

$$+\uparrow \Sigma F_y = 0 = V - 2(20-x) + 14^k$$

$$V = [2(20-x) - 14]\ k \qquad \frac{dM}{dx} = V \ \checkmark$$

$$V(x=20) = -14^k \ \checkmark$$

$F = 2(20-x) \qquad d = \frac{1}{2}(20-x)$