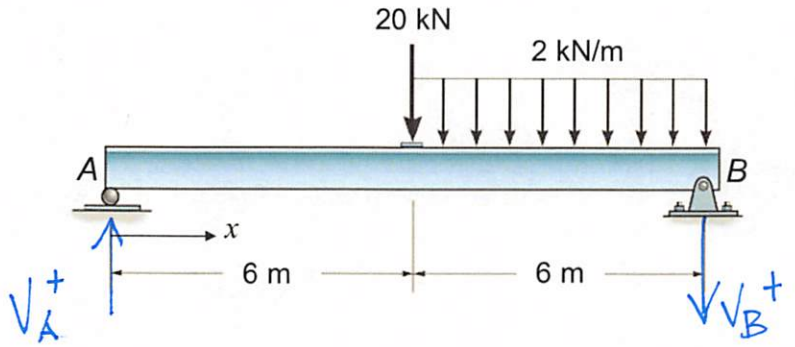
CIVL 3121 Quiz #4 F25 Name: _____

Determine the internal shear force and bending moment as a function of *x* throughout the beam.



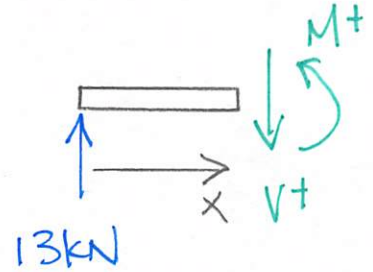
$$\circlearrowleft^+ \sum M_B = 0 = 12kN(3m) + 20kN(6m) - V_A(12m)$$

$$V_A = 13kN$$

$$+\uparrow \sum F_x = 0 = V_A - V_B - 20kN - 12kN$$

$$V_B = -19kN$$

$0 \le x \le 6m$

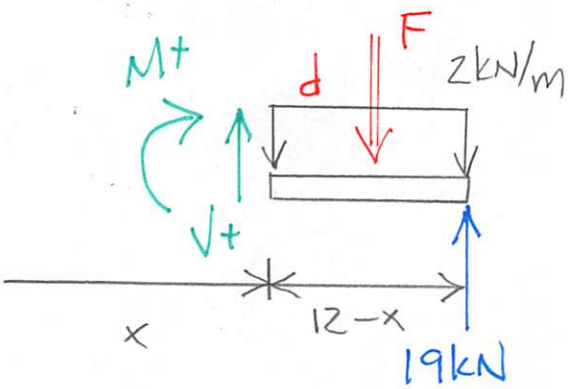


$$\circlearrowleft^+ \sum M_{CUT} = 0 = M - 13kN\,x$$

$$M = [13x]\,kN\,m$$

$$+\uparrow \sum F_y = 0 = -V + 13kN \quad V = 13kN$$

$6 \le x \le 12m$



$F = 2(12-x)\,kN$

$d = \frac{1}{2}(12-x)\,m$

$$\circlearrowleft^+ \sum M_{CUT} = 0 = -M - \underbrace{2(12-x)}_{F}\underbrace{\frac{12-x}{2}}_{d} + 19(12-x)$$

$$M = \left[-(12-x)^2 + 19(12-x)\right]$$

$$+\uparrow \sum F_y = 0 = V - 2(12-x)kN + 19kN$$

$$V = \left[2(12-x) - 19\right]kN$$