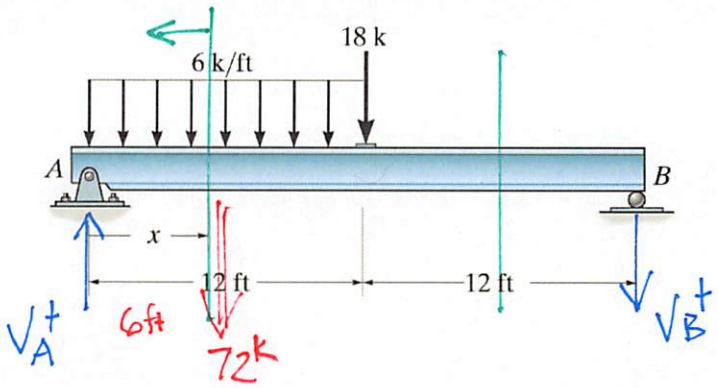
Example 4b-6 - Determine the internal shear and bending moment as a function of ***x***.

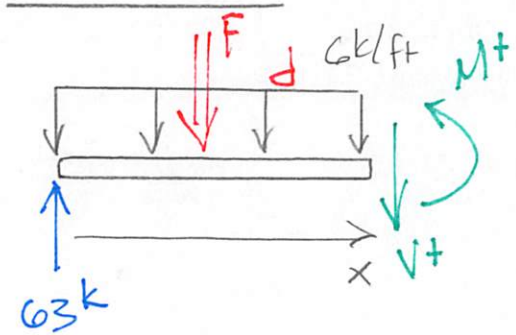


$$\circlearrowleft + \sum M_B = 0 = 18^k(12\,ft) + 72^k(18\,ft) - V_A(24\,ft)$$

$$V_A = 63^k$$

$$+\uparrow \sum F_y = 0 = V_A - V_B - 18^k - 72^k \qquad V_B = -27^k$$

$0 \le x \le 12\,ft$



$F = 6x \quad d = \frac{1}{2}x$

$$\circlearrowleft + \sum M_{CUT} = 0 = M + 6x\left(\frac{x}{2}\right) - 63x$$

$$M(x) = \left[-3x^2 + 63x\right] k\,ft$$

$M(x=0) = 0$ ✓

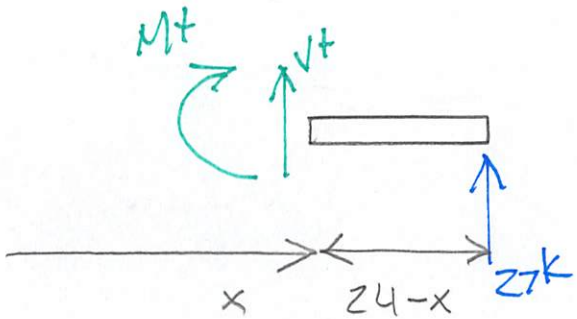
$$+\uparrow \sum F_y = 0 = -V - 6x + 63k$$

$$V(x) = \left[-6x + 63\right] k$$

$V(x=0) = 63^k$ ✓

$\frac{dM}{dx} = V$ ✓

$12 \le x \le 24\,ft$



$$\circlearrowleft + \sum M_{CUT} = 0 = -M + 27(24 - x)$$

$$M(x) = \left[27(24 - x)\right] k\,ft$$

$M(x=24) = 0$ ✓

$M_I(x=12) = M_{II}(x=12)$ ✓

$$+\uparrow \sum F_y = 0 = V + 27k$$

$$V(x) = -27^k$$

$V(x=24\,ft) = -27^k$ ✓

$\frac{dM}{dx} = V$ ✓