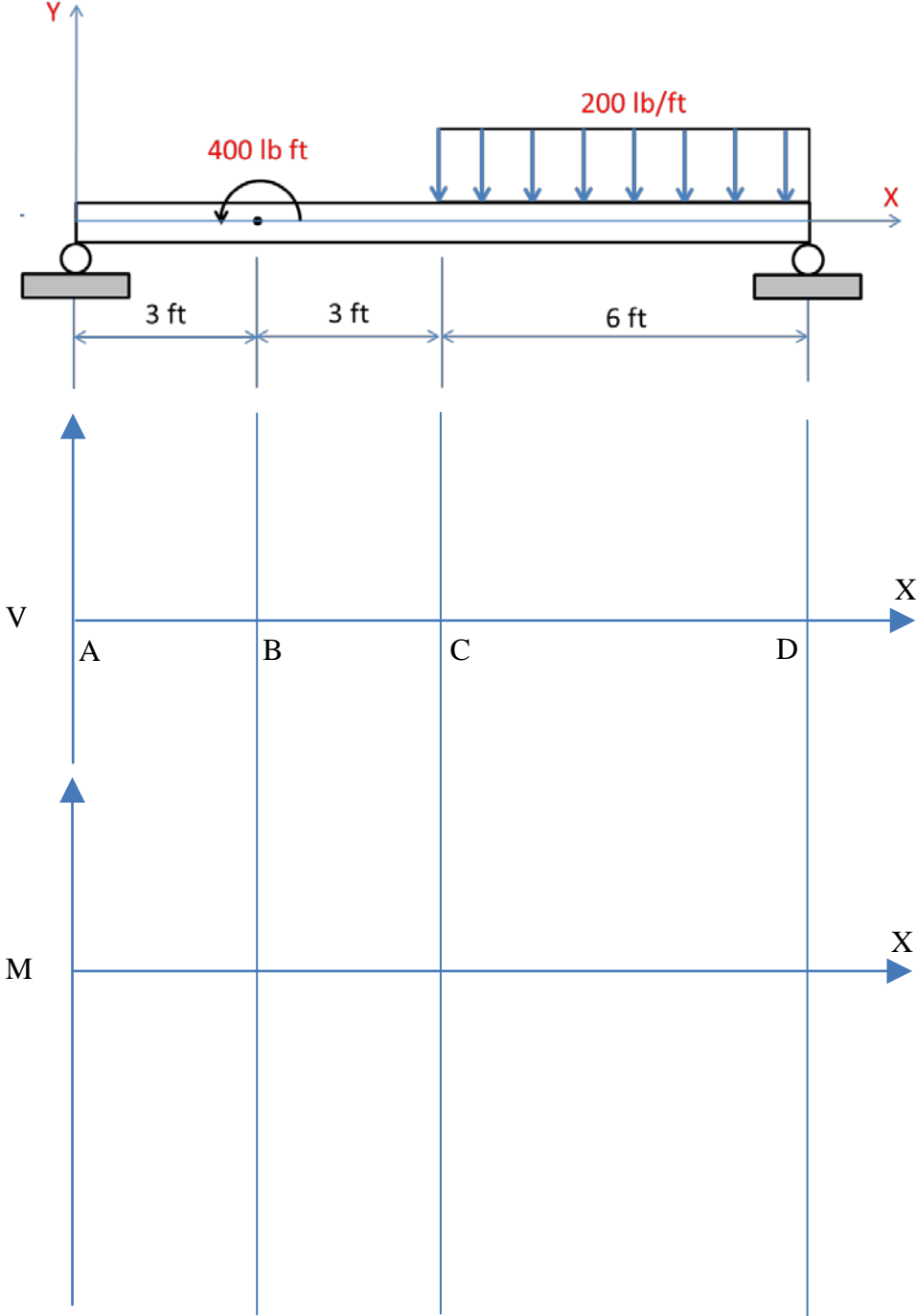
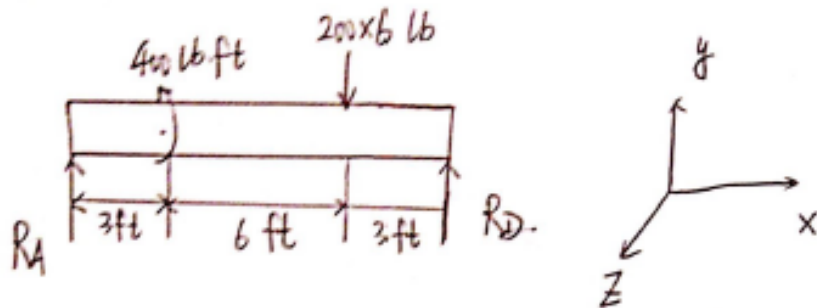


Q1 (10 Points): The beam is subjected to the loading condition as shown below. On the axes shown below, construct scale plots of the internal shear force (V vs. x), and the internal bending moment (M vs. x). Label all critical shear & moment values and their respective units along the beam.



Solution:

FBD:



Force balance: $\sum F_y = 0 \Rightarrow R_A + R_D - 1200 = 0$

Moment balance: $\sum M_D = 0 \Rightarrow -R_A \cdot 12 + 400 + 1200 \times 3 = 0$

$\Rightarrow R_A = 333 \text{ lb}$

$R_D = 867 \text{ lb}$

Shear force and bending moment diagrams:

