



Solution,

From Table 13-1 and use the Method of Superposition  
 case 5. Cantilever beam with a concentrated load at  
 any point

case 6. Cantilever beam with a uniform load

$$\begin{aligned}
 V_{\text{MAX}} &= -P + -wa_2 = -700 \text{ lb} + -\frac{80 \text{ lb}}{\text{ft}} (9 \text{ ft}) \\
 &= -700 \text{ lb} - 720 \text{ lb} \\
 &= \underline{\underline{-1420 \text{ lb}}}
 \end{aligned}$$

$$\begin{aligned}
 M_{\text{MAX}} &= -Pa_1 + -\frac{wa_2^2}{2} \\
 &= -700 \text{ lb} (6 \text{ ft}) + -\frac{80 \text{ lb}}{\text{ft}} (9 \text{ ft})^2 \\
 &= -4200 \text{ lb}\cdot\text{ft} - 3240 \text{ lb}\cdot\text{ft} \\
 &= \underline{\underline{-7440 \text{ lb}\cdot\text{ft}}}
 \end{aligned}$$

TABLE 13-1 Shear and Moment Formulas for Some Simple Loadings

<p>1. Simple beam with a concentrated load at the center</p> <p> <math>V = +\frac{P}{2}</math> (left half), <math>-\frac{P}{2}</math> (right half)  <math>M = +\frac{PL}{4}</math> (at center)         </p>	<p>2. Simple beam with a concentrated load at any point</p> <p> <math>V = +\frac{Pb}{L}</math> (left of load), <math>-\frac{Pa}{L}</math> (right of load)  <math>M_x = \frac{Pbx}{L}</math> (at load point), <math>M = +\frac{Pab}{L}</math> (at load point)         </p>
<p>3. Simple beam with two equal concentrated loads symmetrically placed</p> <p> <math>V = +P</math> (between first load), <math>0</math> (between loads), <math>-P</math> (between second load)  <math>M = +Pa</math> (at center)         </p>	<p>4. Simple beam with a uniform load</p> <p> <math>V = +\frac{wL}{2}</math> (at left end), <math>-\frac{wL}{2}</math> (at right end)  <math>M_x = \frac{wx}{2}(L-x)</math> (at center), <math>M = +\frac{wL^2}{8}</math> (at center)         </p>
<p>5. Cantilever beam with a concentrated load at any point</p> <p> <math>V = -P</math>  <math>M = -Pa</math> (at fixed end)         </p>	<p>6. Cantilever beam with a uniform load</p> <p> <math>V = -wa</math> (at fixed end)  <math>M = -\frac{wa^2}{2}</math> (at fixed end)         </p>