

1.7 A person whose mass is 150 lb weighs 144.4 lbf. Determine (a) the *local* acceleration of gravity, in ft/s^2 , and (b) the person's mass, in lb, and weight, in lbf, if $g = 32.174 \text{ ft/s}^2$.

(a) $F_{\text{grav}} = mg \rightarrow$

$$g = \frac{F_{\text{grav}}}{m} = \frac{144.4 \text{ lbf}}{150 \text{ lb}} \left| \frac{32.174 \text{ lb} \cdot \text{ft/s}^2}{1 \text{ lbf}} \right| = \underline{\underline{30.97 \text{ ft/s}^2}}$$

(b) Mass value remains the same. So

$$F_{\text{grav}} = mg = (150 \text{ lb}) \left(32.174 \frac{\text{ft}}{\text{s}^2} \right) \left| \frac{1 \text{ lbf}}{32.174 \text{ lb} \cdot \text{ft/s}^2} \right| = \underline{\underline{150 \text{ lbf}}}$$