

PROB. 11-153

$$a_n = g \left(\frac{R}{r} \right)^2, \quad g = 9.53 \frac{\text{m}}{\text{s}^2}, \quad R = 6161 \text{ km},$$

$$r = 160 \text{ km} + 6161 \text{ km} = 6321 \text{ km}$$

FIND v

$$a_n = \frac{v^2}{r} = \frac{v^2}{r} = g \left(\frac{R}{r} \right)^2$$

$$v = \sqrt{\frac{g R^2}{r}}$$

$$v = \sqrt{\frac{(9.53 \frac{\text{m}}{\text{s}^2})(6161 \text{ km})^2 \left(\frac{1000 \text{ m}}{\text{km}}\right)^1}{(6321 \text{ km})}}$$

$$v = \left(7157 \frac{\text{m}}{\text{s}} \right) \left(\frac{3600 \text{ s}}{\text{h}} \right) \left(\frac{\text{km}}{1000 \text{ m}} \right) = 25,765 \frac{\text{km}}{\text{h}}$$