[24 pts.] A rock is hurled from the top of a three-story building (h = 12.0 m) with a velocity (\( \vec{V}_0 \)) of 26.0 m/s at an angle of 37.0° (\( \theta \)) above the horizontal (see drawing). Find the horizontal distance (R) of the rock just as it hits the ground.

**First find time of flight to ground for CS CHP5BN**
\[ h = v_0 \sin \theta \cdot t + \frac{1}{2} a_y \cdot t^2 \]
\[ h = 20 \sin 37^\circ \cdot t - \frac{1}{2} \cdot 9.8 \cdot t^2 \]
\[ -12.0 = 20 \sin 37^\circ \cdot t - \frac{1}{2} \cdot 9.8 \cdot t^2 \]
\[ 4.9 \cdot t^2 - 15.6 \cdot t + 12.0 = 0 \]

**Use quadratic**
\[ t = \frac{-15.6 \pm \sqrt{(-15.6)^2 - 4(4.9)(12.0)}}{9.8} \]
\[ t = \frac{-15.6 \pm \sqrt{234.44 - 4 \cdot 4.9 \cdot 12.0}}{9.8} \]
\[ t = \frac{-15.6 \pm \sqrt{156.84}}{9.8} \]
\[ t = \frac{-15.6 \pm 12.5}{9.8} \]
\[ t = 3.825, -0.435 \]

**Calculate R**
\[ x = R = x_0 = v_0 \cos \theta \cdot t \]
\[ R = (20.8 \text{ m/s}) (3.825) \]
\[ R = 79.5 \text{ m} \]