$$Mv = Mv_1 + mv_2$$

$$\frac{1}{2}Mv^2 = \frac{1}{2}M{v_1}^2 + \frac{1}{2}m{v_2}^2$$

$$v_1 = \left[1 - \frac{2}{1 + (M/m)}\right] v$$

$$v_2 = \left[\frac{2}{1 + (m/M)}\right] v$$

$$v_1 \simeq \left(1 - \frac{2m}{M}\right) v \sim v$$

$$v_2 \simeq 2v$$