79. (a) We find the velocity $\vec{v}_{1f}$ of the 1200 kg car after the collision (taking the direction of motion as positive) using momentum conservation (with mass in kg and speed in km/h).

$$\begin{aligned} m_1\vec{v}_{1i} + m_2\vec{v}_{2i} &= m_1\vec{v}_{1f} + m_2\vec{v}_{2f} \\ (1200)(70) + (900)(60) &= (1200)\vec{v}_{1f} + (900)(70) \end{aligned}$$

This gives the result $\vec{v}_{1f} = 62.5$ km/h.

(b) We compute the reduction of total kinetic energy in the collision:

$$Q = K_i - K_f = \frac{1}{2}(1200)(70)^2 + \frac{1}{2}(900)(60)^2 - \frac{1}{2}(1200)(62.5)^2 - \frac{1}{2}(900)(70)^2$$

which gives the result 11250 in mixed units (kg·km^2/h^2). We set up the requested ratio (where $v_o = 5$ km/h):

$$\frac{Q}{\frac{1}{2}m_1 v_o^2} = \frac{11250}{15000} = \frac{3}{4} \ .$$