34. We think of this as having two parts: the first is the collision itself – where the blocks "join" so quickly that the 1.0-kg block has not had time to move through any distance yet – and then the subsequent motion of the 3.0 kg system as it compresses the spring to the maximum amount x_{m}. The first part involves momentum conservation (with $+x$ rightward):

$$(2.0\,\mathrm{kg})(4.0\,\mathrm{m/s}) = (3.0\,\mathrm{kg})\vec{v}$$

which yields $\vec{v} = 2.7$ m/s. The second part involves mechanical energy conservation:

$$\frac{1}{2}(3.0\,\mathrm{kg})(2.7\,\mathrm{m/s})^2 = \frac{1}{2}(200\,\mathrm{N/m})x_{\mathrm{m}}^2$$

which gives the result $x_{\mathrm{m}} = 0.33$ m.