

HW6-3 Soln)

The easiest thing to do is remember that the area under this curve is the work:

$$W = \text{area} = \frac{1}{2}bh = \frac{1}{2}(3)(15) = 22.5 \text{ Joules} .$$

Then, use the work-energy theorem:

$$W_{\text{TOTAL}} = \Delta K = \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$

starts from rest

$$v_f = \sqrt{\frac{2W_{\text{TOTAL}}}{m}} = \sqrt{\frac{2(22.5)}{3}} = 3.78 \text{ m/s} .$$