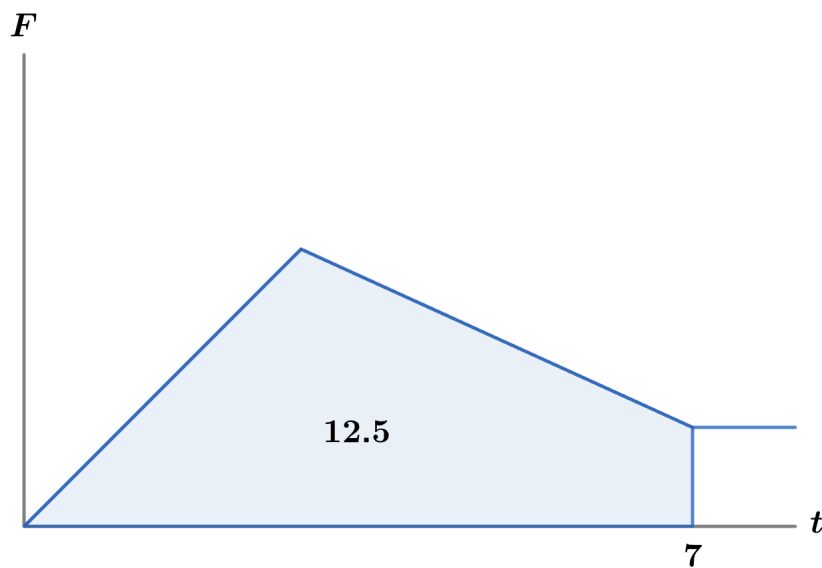


2014 F=ma Exam: Problem 9

Kevin S. Huang



Recall the area under a F - t plot corresponds to the impulse J . By the impulse-momentum theorem,

$$J = \Delta p = p_f - p_i = m(v_f - v_i)$$

Solving for the final velocity v_f ,

$$v_f = v_i + \frac{J}{m}$$

In our case, going from $t = 0$ s to 7 s, we have $J = 12.5$ kg m/s so

$$v_f = 1 \text{ m/s} + \frac{12.5 \text{ kg m/s}}{5 \text{ kg}} = 3.5 \text{ m/s}$$

Thus, the answer is C.