20-P-WF-AF-006

Principle of Work & Energy: Beginner

Q: A crate of mass M kg is being lifted by a force described as $F = \frac{s}{2} + A$. What is the velocity after $s = S$?

A:

$$T_1 + \sum U_{1-2} = T_2$$

$$0 + \int_0^S \left[\frac{s}{2} + A\right] ds = \frac{1}{2} m v_2^2$$

$$s^2 + As \Big|_0^S - M \cdot 9.80 \cdot S = \frac{1}{2} m v^2$$

$$\left[\frac{2}{M}\left[S^2 + AS - M \cdot 9.8S\right]\right]^{\frac{1}{2}} = v$$