

20-P-KM-AF-01

Rectilinear Continuous Motion: Beginner

Q:

The particle moves with an acceleration $a = A + Bs$, along a straight line. What is the velocity when $s = C$.



A: Use equation $a ds = v dv$

$$\int_0^C [A + Bs] ds = \int_0^v v dv$$

$$\left[As + \frac{Bs^2}{2} \right]_0^C = \frac{v^2}{2}$$

$$AC + \frac{BC^2}{2} = \frac{v^2}{2} \quad \Rightarrow \quad v^2 = 2AC + BC^2$$

$$v = \sqrt{2AC + BC^2}$$