

Kinematics - Exercises (1 page; 9/2/26)

(1) Given that the velocity of a particle as a function of its displacement is $v(x) = 10e^{-x}$ and that $x = 0$ when $t = 0$, find:

- (i) the acceleration as a function of x
- (ii) x as a function of t
- (iii) v as a function of t
- (iv) the acceleration as a function of t

(2)(i) Show that $\int a(x)dx = \frac{1}{2}v^2$ (*)

(ii) Given that the acceleration of a particle as a function of its displacement is $a(x) = x + 1$, and that $x = 0$ and $v = 1$ when $t = 0$, find x in terms of t for $x > 0$ [The result (*) can be used.]