Answer on Question #50063, Physics, Mechanics | Kinematics | Dynamics

Task:

A body of mass 3 kg is under the the force, which causes displacement in it is given by $S=t^3/3$ (in m). Find the work done by the force in first 2 sec.

(1)2

(2)3.8

(3)5.2

(4)24

All are in joules

Solution:

$v = dS/dt = t^2$

$v_o = v(t = 0) = 0$ m/s

$v_f = v(t = 2\ s) = 4$ m/s

$KE_o = (1/2)\ m\ v_o^2 = (1/2)\ (3.0\ kg)\ (0\ m/s)^2 = 0$ J

$KE_f = (1/2)\ m\ v_v^2 = (1/2)\ (3.0\ kg)\ (4\ m/s)^2 = 24$ J

$W_{net} = \Delta KE = 24$ J

Answer: (4)24