Answer on Question #49239-Physics-Mechanics-Kinematics-Dynamics

The position x of a particle moving along x axis at time (t) is given by equation $t = x^{\frac{1}{2}} + 2$, where x is un meters and t in seconds. Find the work done by force in first 4 seconds.

(1) Zero

(2) 2

(3) 4

(4) 8

All are in Joules.

Solution

$$t = \sqrt{x} + 2 \rightarrow x = (t-2)^2, x(0) = 2^2 = 4m, x(4) = 2^2 = 4m.$$

The work done by force in first 4 seconds is zero, because

$$W = \int_{x(0)}^{x(4)} Fxdx = \int_{4}^{4} Fxdx \equiv 0,$$

where F is the force.

Answer: (1) Zero.