Question 35

A body of mass m kg moves in a straight line. When its displacement is x m from the origin, its velocity is v ms^{-1} at a time t seconds. The force acting on the body is $mf(x)$ newtons. Given that $v = v_0$ when $x = x_0$ and $v = v_1$ when $x = x_1$, it follows that

A. $\dfrac{1}{2}mv_1^2 - \dfrac{1}{2}mv_0^2 = m\left[f(x_1) - f(x_0)\right]$

B. $\dfrac{1}{2}mv_1^2 - \dfrac{1}{2}mv_0^2 = m\displaystyle\int_{x_0}^{x_1} f(x)\,dx$

C. $v_1 - v_0 = \left[f(x_1) - f(x_0)\right]$

D. $v_1 - v_0 = \displaystyle\int_{x_0}^{x_1} f(x)\,dx$

E. $v_1 = \sqrt{v_0^2 + m\displaystyle\int_{x_0}^{x_1} f(x)\,dx}$