A particle P is projected horizontally from a point O on a rough horizontal surface. The coefficient of friction between the particle and the surface is 0.2. A horizontal force of magnitude $0.06t$ N directed away from O acts on P, where t s is the time after projection. P comes to rest when $t = 4$.

(i) The particle begins to move again when $t = 8$. Show that the mass of P is 0.24 kg. [2]

(ii) Show that, for $0 \leqslant t \leqslant 4$, $\dfrac{\mathrm{d}v}{\mathrm{d}t} = 0.25t - 2$, and find the speed of projection of P. [5]

(iii) Find the distance from O at which P comes to rest. [4]