A particle P moves in a straight line. The velocity $v\,\text{m s}^{-1}$ at time t seconds is given by

$$v = 0.5t \qquad \text{for} \quad 0 \leqslant t \leqslant 10,$$
$$v = 0.25t^2 - 8t + 60 \qquad \text{for} \quad 10 \leqslant t \leqslant 20.$$

(a) Show that there is an instantaneous change in the acceleration of the particle at $t = 10$. [3]

(b) Find the total distance covered by P in the interval $0 \leqslant t \leqslant 20$. [6]