3. A fixed point O lies on a straight line.

A particle P moves along this line.

At time $t = 0$, particle P passes through O

At time t seconds, $t \geqslant 0$, the velocity, $v\,\text{m s}^{-1}$, of P is

$$v = 6 + 4t^{\frac{3}{2}} - 3t^2$$

(a) Find the acceleration of P at time t seconds.

(2)

(b) Find the distance of P from O at the instant when $t > 0$ and the acceleration of P is zero.

(6)