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5. At time t seconds ($t \geqslant 0$), a particle P has velocity $\mathbf{v}\,\text{m s}^{-1}$, where

$$\mathbf{v} = (3t^2 - 9t + 6)\mathbf{i} + (t^2 + t - 6)\mathbf{j}$$

(a) Find the acceleration of P when $t = 3$

(3)

When $t = 0$, P is at the fixed point O.

The particle comes to instantaneous rest at the point A.

(b) Find the distance OA.

(7)

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Question 5 continued

(Total 10 marks)

Q5