2. [*In this question* **i** *and* **j** *are horizontal unit vectors.*]

A particle P of mass 0.5 kg is moving on a smooth horizontal plane.

The origin O is on the plane.

At time $t = 0$, P passes through O moving with velocity $(\mathbf{i} - \mathbf{j})\,\mathrm{m\,s^{-1}}$

At time t seconds, the resultant horizontal force acting on P is

$$[(3t - 1)\mathbf{i} + 2\mathbf{j}]\,\mathrm{N}$$

(a) Find the velocity of P at $t = 2$

(5)

(b) Find the distance of P from O at $t = 2$

(4)