**9** A particle $P$ of mass 2.5 kg is in equilibrium under the action of three horizontal forces $\mathbf{F}_1 = \begin{pmatrix} 3 \\ -7 \end{pmatrix}$N, $\mathbf{F}_2 = \begin{pmatrix} -5 \\ 10 \end{pmatrix}$N and $\mathbf{F}_3$.

**(a)** Find the force $\mathbf{F}_3$. **[2]**

The force $\mathbf{F}_3$ is changed to $\begin{pmatrix} 8 \\ 1 \end{pmatrix}$N.

**(b)** Find the acceleration of $P$, giving your answer in column vector form. **[2]**