3 Referred to a fixed origin O, the position vectors of the points P and Q are $(5\mathbf{i} + 6\mathbf{j})$ and $(3\mathbf{i} - 4\mathbf{j})$ respectively.

(a) Find, as a simplified expression in terms of **i** and **j**, $\overrightarrow{PQ}$.

(2)

(b) Find a unit vector parallel to $\overrightarrow{PQ}$.

(2)

The position vector of the fixed point R is $(13\mathbf{i} + a\mathbf{j})$, where a is a constant.

Given that $\overrightarrow{QR} = 5\overrightarrow{QP}$

(c) find the value of a.

(2)

Question 3 continued

(Total for Question 3 is 6 marks)