

- 6 The points  $P$ ,  $Q$ ,  $R$  and  $S$  are the vertices of a quadrilateral  $PQRS$  such that

$$\overrightarrow{PQ} = 2\mathbf{i} + 3\mathbf{j} \quad \overrightarrow{PR} = -\mathbf{i} + 18\mathbf{j} \quad \overrightarrow{PS} = -3\mathbf{i} + 15\mathbf{j}$$

- (a) Show that  $PQRS$  is a parallelogram.

(4)

- (b) Find a unit vector parallel to  $\overrightarrow{QS}$  as a simplified expression in terms of  $\mathbf{i}$  and  $\mathbf{j}$

(4)

The point  $T$  lies on  $QS$  such that  $QT:TS = 5:8$

- (c) Find  $\overrightarrow{PT}$  as a simplified expression in terms of  $\mathbf{i}$  and  $\mathbf{j}$

(2)

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**Question 6 continued**

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**Question 6 continued**

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**(Total for Question 6 is 10 marks)**

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