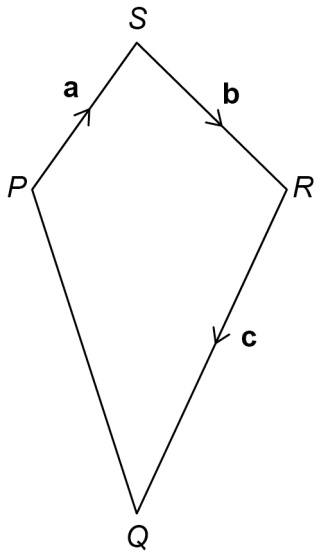
1 Here is quadrilateral $PQRS$.

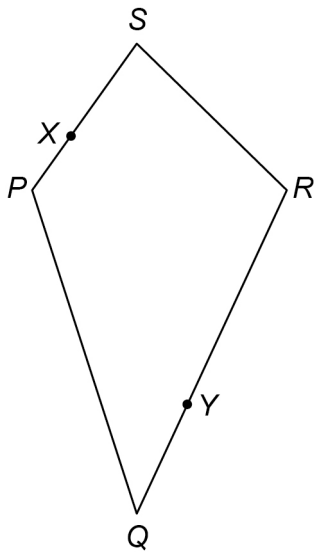
$\overrightarrow{PS} = \mathbf{a}$ $\overrightarrow{SR} = \mathbf{b}$ $\overrightarrow{RQ} = \mathbf{c}$



Not drawn accurately

X is a point on PS where $PX : XS = 1 : 2$

Y is a point on RQ where $RY : YQ = 2 : 1$



Not drawn accurately

Is XY parallel to PQ?

Show working to support your answer.

[3 marks]

2 In the diagram

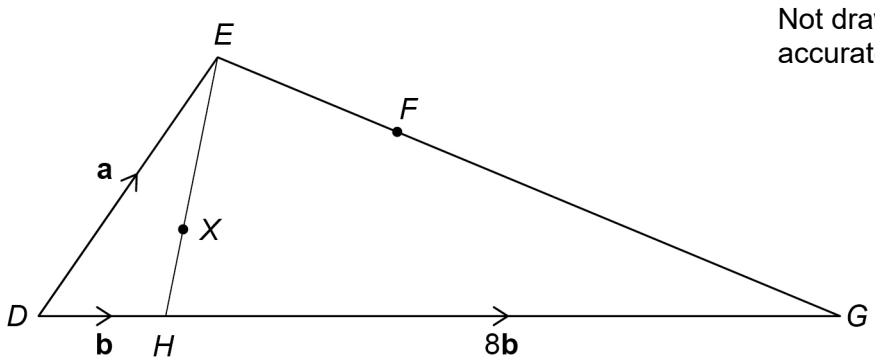
$\overrightarrow{DE} = \mathbf{a}$

$\overrightarrow{DH} = \mathbf{b}$

$\overrightarrow{HG} = 8\mathbf{b}$

$EX : XH = 3 : 1$

$EF : FG = 1 : 3$



2 (a) Show that $\overrightarrow{DX} = \frac{1}{4}\mathbf{a} + \frac{3}{4}\mathbf{b}$

[2 marks]

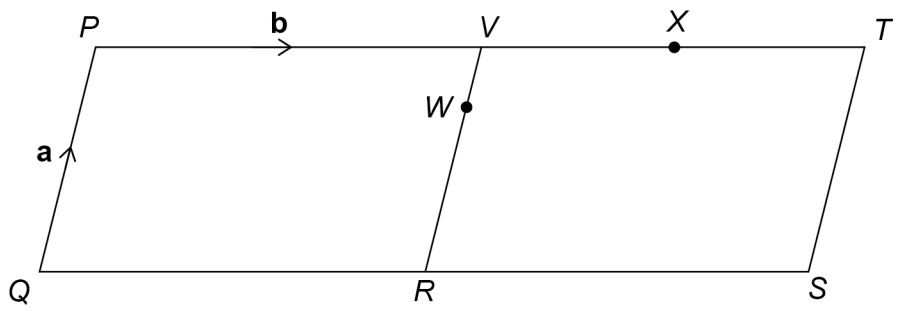
2 (b) Is *DXF* a straight line?

Show working to support your answer.

[4 marks]

3 Two congruent parallelograms, *PQRV* and *VRST*, are joined.

Not drawn accurately



$\overrightarrow{QP} = \mathbf{a}$ $\overrightarrow{PV} = \mathbf{b}$

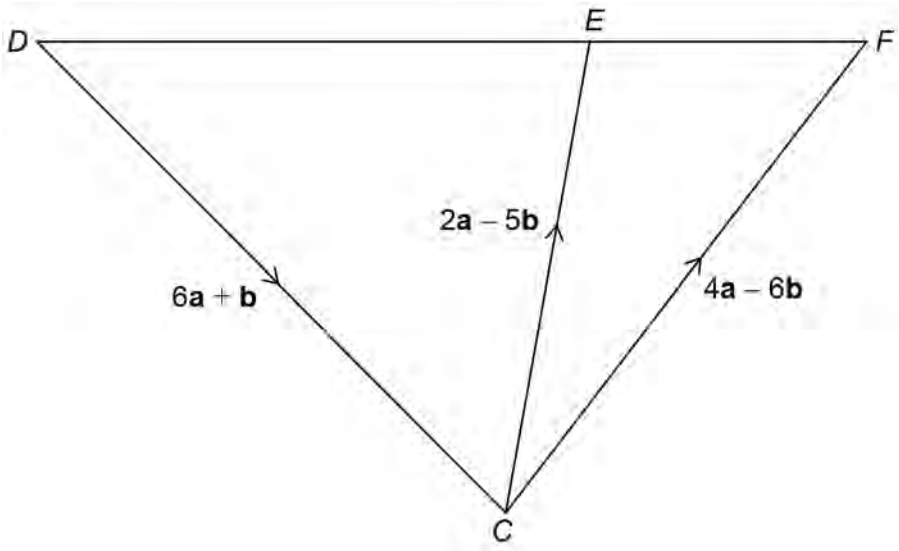
X is the midpoint of *VT*.

VW : *WR* = 1 : 2

Prove that *Q, W* and *X* lie on a straight line.

[3 marks]

4



Not drawn accurately

Prove that *DEF* is a straight line.

[4 marks]