1 *CDEF* is a quadrilateral.
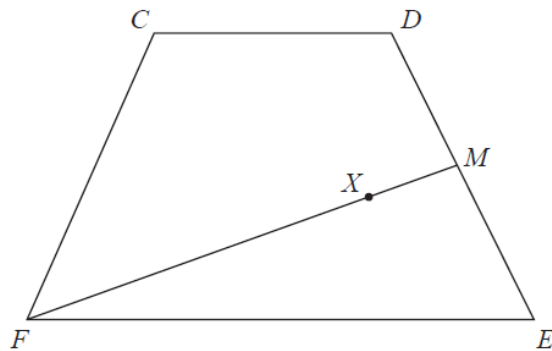
$\overrightarrow{CD}$ = **a**, $\overrightarrow{DE}$ = **b** and $\overrightarrow{FC}$ = **a** − **b**.

(a) Express $\overrightarrow{FE}$ in terms of **a** and/or **b**.
   Give your answer in its simplest form.

....

(2)

M is the midpoint of *DE*.
X is the point on *FM* such that $FX:XM = n:1$
CXE is a straight line.

(b) Work out the value of *n*.

$n =$ ....

(4)

(Total for Question   is 6 marks)

2 $OXYZ$ is a parallelogram.
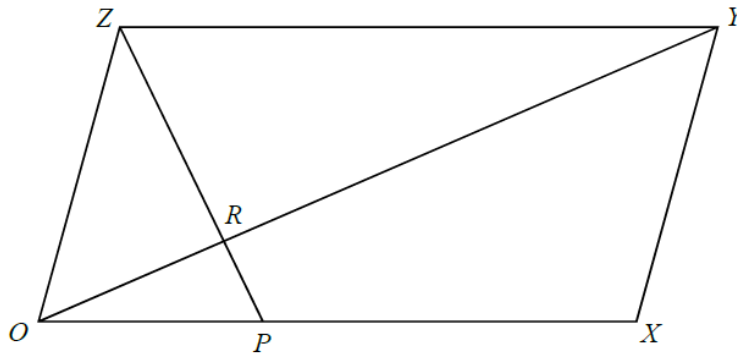
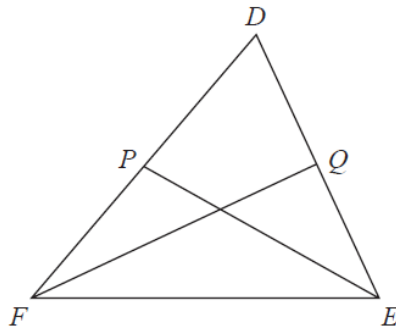$\overrightarrow{OX} = \mathbf{a}$

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

P is the point on OX such that $OP:PX = 1:2$
R is the point on OY such that $OR:RY = 1:3$

Work out, in its simplest form, the ratio $ZP:ZR$
You must show all your working.

(Total for Question   is 5 marks)
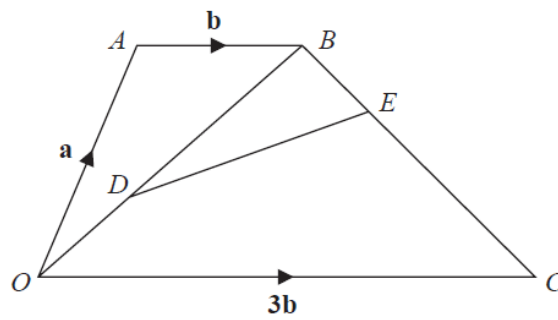
3 *DEF* is a triangle.

P is the midpoint of *FD*.
Q is the midpoint of *DE*.

$\overrightarrow{FD} = \mathbf{a}$ and $\overrightarrow{FE} = \mathbf{b}$

Use a vector method to prove that *PQ* is parallel to *FE*.

(Total for Question   is 4 marks)

4 *OABC* is a trapezium.

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

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

$\overrightarrow{OC} = \mathbf{3b}$

D is the point on *OB* such that $OD:DB = 2:3$

E is the point on *BC* such that $BE:EC = 1:4$

Work out the vector $\overrightarrow{DE}$ in terms of **a** and **b**.

Give your answer in its simplest form.

....

(Total for Question   is 4 marks)