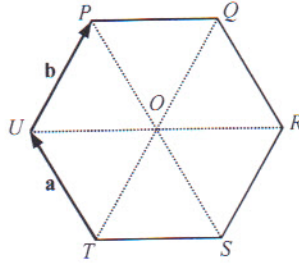


May 08 4H

Leave blank

21. $PQRSTU$ is a regular hexagon, centre O .
The hexagon is made from six equilateral triangles of side 2.5 cm.



$$\overrightarrow{TU} = \mathbf{a}, \overrightarrow{UP} = \mathbf{b}$$

- (a) Find, in terms of \mathbf{a} and/or \mathbf{b} , the vectors

(i) \overrightarrow{TP}

..... (1)

(ii) \overrightarrow{PO}

..... (1)

(iii) \overrightarrow{UO}

..... (1)

- (b) Find the modulus (magnitude) of \overrightarrow{UR} .

..... cm (1)

(Total 4 marks)

Q21

20. A is the point with coordinates $(2, 3)$.

Nov 05 4H

$$\overrightarrow{AB} = \begin{pmatrix} 5 \\ -4 \end{pmatrix}$$

Find the coordinates of B .

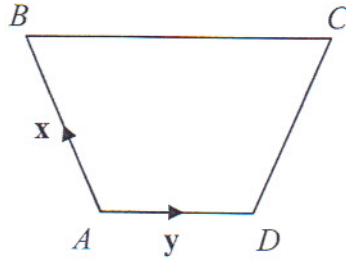
(.....,)

(Total 2 marks)

Q20

Nov 08 4H

19. The diagram shows a trapezium $ABCD$.



$$\vec{BC} = 2\vec{AD}.$$

$$\vec{AB} = \mathbf{x}. \quad \vec{AD} = \mathbf{y}.$$

(a) Find, in terms of \mathbf{x} and \mathbf{y} ,

(i) \vec{AC}

.....

(ii) \vec{DC}

.....

(2)

(b) The point E is such that $\vec{AE} = \mathbf{x} + \mathbf{y}$.

Use your answer to part (a)(ii) to explain why $AECD$ is a parallelogram.

.....

.....

(2)

(Total 4 marks)

Q19

May 06 4H

14. $OABC$ is a parallelogram.

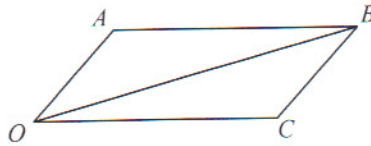


Diagram **NOT** accurately drawn

$$\vec{OA} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}, \vec{OC} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}.$$

(a) Find the vector \vec{OB} as a column vector.

()
.....
(1)

X is the point on OB such that $OX = kOB$, where $0 < k < 1$

(b) Find, in terms of k , the vectors

(i) \vec{OX} ,

.....

(ii) \vec{AX} ,

.....

(iii) \vec{XC} .

.....

(3)

(c) Find the value of k for which $\vec{AX} = \vec{XC}$.

.....

(2)

(d) Use your answer to part (c) to show that the diagonals of the parallelogram $OABC$ bisect one another.

.....

.....

.....

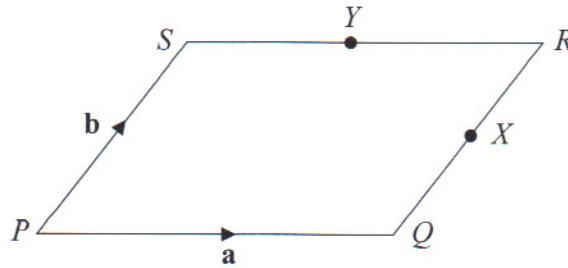
(2)

(Total 8 marks)

22.

May 04 4H

Leave blank



$PQRS$ is a parallelogram.
 X is the midpoint of QR and Y is the midpoint of SR .
 $\vec{PQ} = \mathbf{a}$ and $\vec{PS} = \mathbf{b}$.

(a) Write down, in terms of \mathbf{a} and \mathbf{b} , expressions for

(i) \vec{PX}

.....

(ii) \vec{PY}

.....

(iii) \vec{QS}

.....

(3)

(b) Use a vector method to show that XY is parallel to QS and that $XY = \frac{1}{2}QS$.

(2)

Q22

(Total 5 marks)

--

May 07 BH

16. PQR is a triangle.

E is the point on PR such that $PR = 3PE$.

F is the point on QR such that $QR = 3QF$.

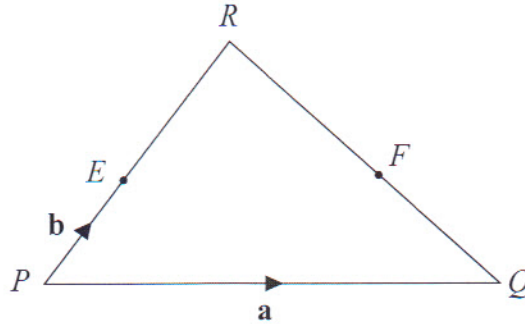


Diagram **NOT** accurately drawn

$\vec{PQ} = \mathbf{a}, \quad \vec{PE} = \mathbf{b}.$

(a) Find, in terms of \mathbf{a} and \mathbf{b} ,

(i) \vec{PR}

.....

(ii) \vec{QR}

.....

(iii) \vec{PF}

.....

(3)

(b) Show that $\vec{EF} = k\vec{PQ}$ where k is an integer.

(2)

(Total 5 marks)

Q16

