

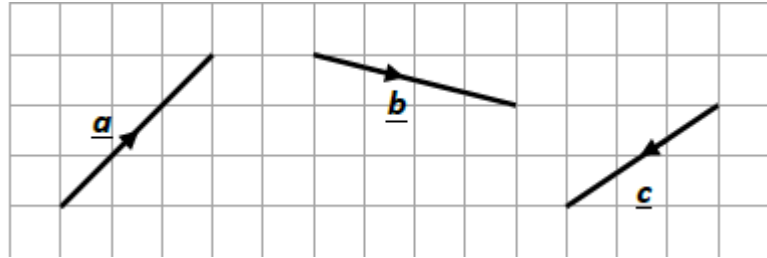


Ross High School: Mathematics Department

Higher Mathematics: Homework 3

1. Write down the components of:

- a. vector \mathbf{a}
- b. vector \mathbf{b}
- c. vector \mathbf{c}



(3)

2. PQRS is parallelogram

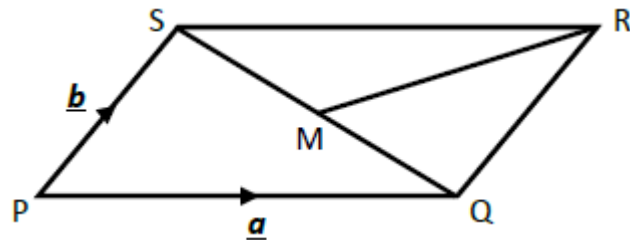
M is the midpoint of PQ

PQ is represented by the vector \mathbf{a} and PS is represented by the vector \mathbf{b}

Express the following in terms of \mathbf{a} and \mathbf{b} :

(a) \vec{SQ}

(b) \vec{SM}

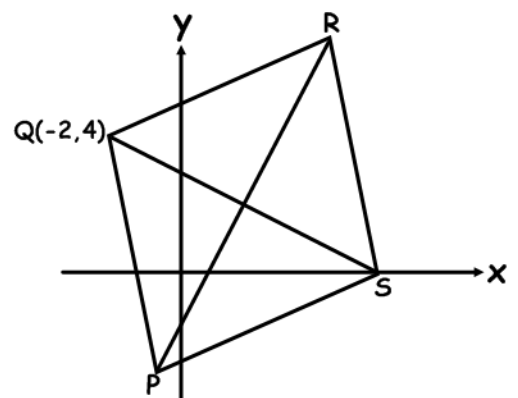


(1)

(1)

3. The diagram shows a rhombus PQRS with its diagonals PR and QS.

PR has equation $y = 2x - 2$ and Q has coordinates $(-2, 4)$.



(a) Find the equation of the diagonal QS.

(3)

(b) Find the coordinates of T, the point of intersection of PR and QS.

(2)

(c) R is the point $(5, 8)$. Write down the coordinates of P.

(1)

4. Calculate the magnitude of each vector below, leaving your answer as a surd in its simplest form.

a) $\underline{u} = \begin{pmatrix} 2 \\ 4 \\ 5 \end{pmatrix}$

(b) $\underline{v} = \begin{pmatrix} \sqrt{7} \\ \sqrt{2} \\ 3\sqrt{2} \end{pmatrix}$

(5)