

2.

$$\mathbf{A} = \begin{pmatrix} 2 & 0 \\ 5 & 3 \end{pmatrix}, \quad \mathbf{B} = \begin{pmatrix} -3 & -1 \\ 5 & 2 \end{pmatrix}$$

(a) Find \mathbf{AB} .

(3)

Given that

$$\mathbf{C} = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$$

(b) describe fully the geometrical transformation represented by \mathbf{C} ,

(2)

(c) write down \mathbf{C}^{100} .

(1)

Q2

(Total 6 marks)



6.

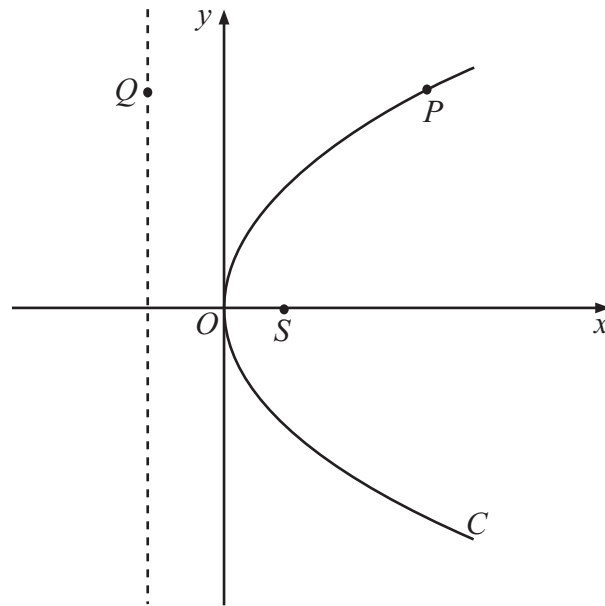


Figure 1

Figure 1 shows a sketch of the parabola C with equation $y^2 = 36x$.
The point S is the focus of C .

(a) Find the coordinates of S . (1)

(b) Write down the equation of the directrix of C . (1)

Figure 1 shows the point P which lies on C , where $y > 0$, and the point Q which lies on the directrix of C . The line segment QP is parallel to the x -axis.

Given that the distance PS is 25,

(c) write down the distance QP , (1)

(d) find the coordinates of P , (3)

(e) find the area of the trapezium $OSPQ$. (2)



7. $z = -24 - 7i$

(a) Show z on an Argand diagram. **(1)**

(b) Calculate $\arg z$, giving your answer in radians to 2 decimal places. **(2)**

It is given that

$$w = a + bi, \quad a \in \mathbb{R}, b \in \mathbb{R}$$

Given also that $|w| = 4$ and $\arg w = \frac{5\pi}{6}$,

(c) find the values of a and b , **(3)**

(d) find the value of $|zw|$. **(3)**



