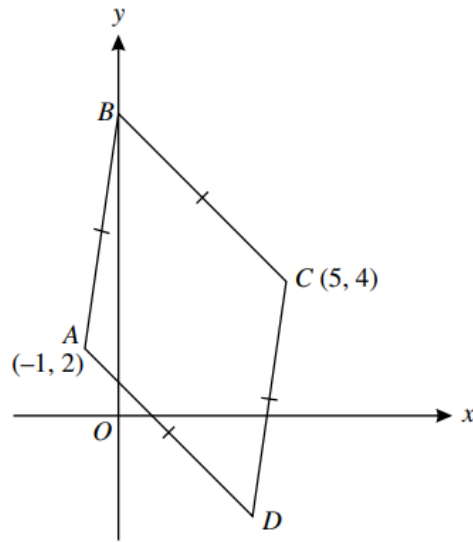


Coordinate Geometry 1

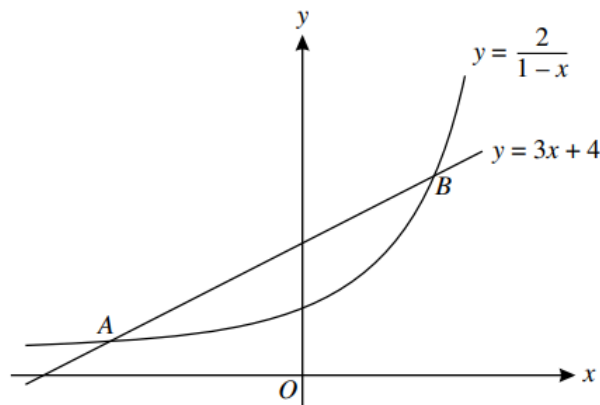
Q1.



The diagram shows a rhombus $ABCD$ in which the point A is $(-1, 2)$, the point C is $(5, 4)$ and the point B lies on the y -axis. Find

- (i) the equation of the perpendicular bisector of AC , [3]
 - (ii) the coordinates of B and D , [3]
 - (iii) the area of the rhombus. [3]
-

Q2.



The diagram shows part of the curve $y = \frac{2}{1-x}$ and the line $y = 3x + 4$. The curve and the line meet at points A and B .

- (i) Find the coordinates of A and B . [4]
 - (ii) Find the length of the line AB and the coordinates of the mid-point of AB . [3]
-

Coordinate Geometry 1

Q3.

The line L_1 passes through the points $A(2, 5)$ and $B(10, 9)$. The line L_2 is parallel to L_1 and passes through the origin. The point C lies on L_2 such that AC is perpendicular to L_2 . Find

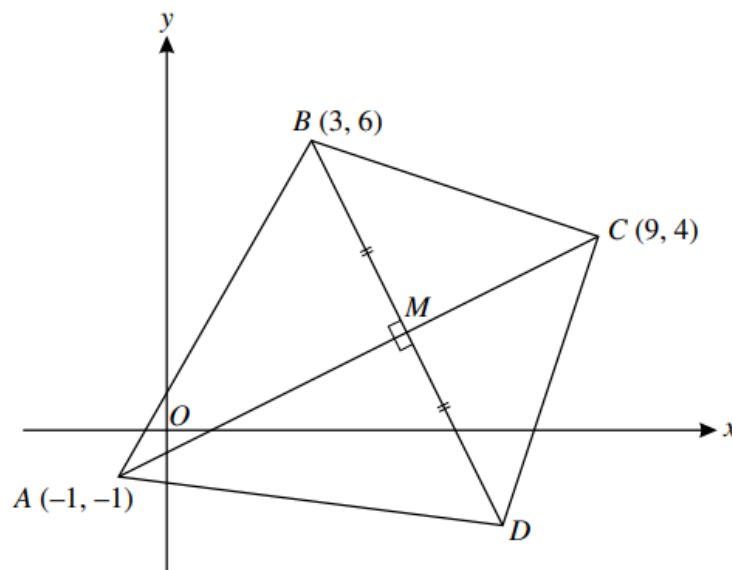
(i) the coordinates of C , [5]

(ii) the distance AC . [2]

Q4.

The line $\frac{x}{a} + \frac{y}{b} = 1$, where a and b are positive constants, meets the x -axis at P and the y -axis at Q . Given that $PQ = \sqrt{45}$ and that the gradient of the line PQ is $-\frac{1}{2}$, find the values of a and b . [5]

Q5.



The diagram shows a quadrilateral $ABCD$ in which the point A is $(-1, -1)$, the point B is $(3, 6)$ and the point C is $(9, 4)$. The diagonals AC and BD intersect at M . Angle $BMA = 90^\circ$ and $BM = MD$. Calculate

(i) the coordinates of M and D , [7]

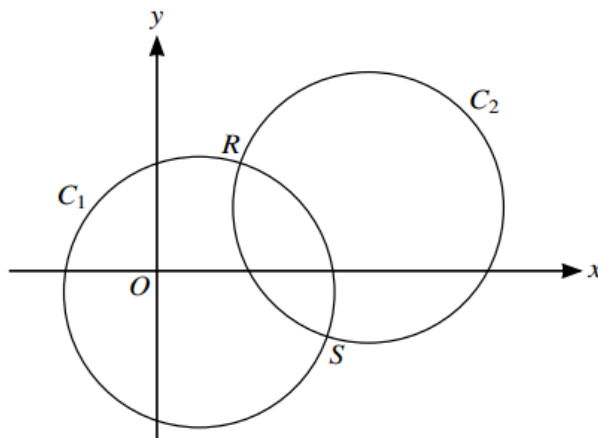
(ii) the ratio $AM : MC$. [2]

Coordinate Geometry 1

Q6.

A diameter of a circle C_1 has end-points at $(-3, -5)$ and $(7, 3)$.

- (a) Find an equation of the circle C_1 . [3]



The circle C_1 is translated by $\begin{pmatrix} 8 \\ 4 \end{pmatrix}$ to give circle C_2 , as shown in the diagram.

- (b) Find an equation of the circle C_2 . [2]

The two circles intersect at points R and S .

- (c) Show that the equation of the line RS is $y = -2x + 13$. [4]

- (d) Hence show that the x -coordinates of R and S satisfy the equation $5x^2 - 60x + 159 = 0$. [2]
-

Q7.

The equation of a circle with centre C is $x^2 + y^2 - 8x + 4y - 5 = 0$.

- (a) Find the radius of the circle and the coordinates of C . [3]

The point $P(1, 2)$ lies on the circle.

- (b) Show that the equation of the tangent to the circle at P is $4y = 3x + 5$. [3]

The point Q also lies on the circle and PQ is parallel to the x -axis.

- (c) Write down the coordinates of Q . [2]

The tangents to the circle at P and Q meet at T .

- (d) Find the coordinates of T . [3]

Coordinate Geometry 1

Q8.

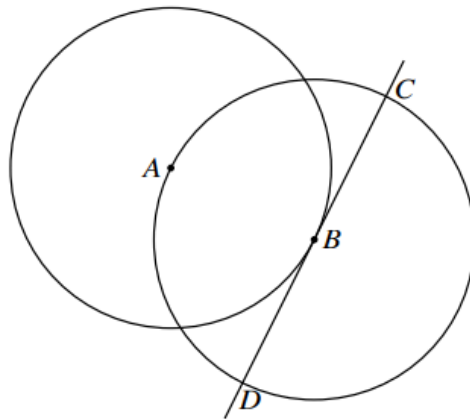
- (a) The coordinates of two points A and B are $(-7, 3)$ and $(5, 11)$ respectively.

Show that the equation of the perpendicular bisector of AB is $3x + 2y = 11$. [4]

- (b) A circle passes through A and B and its centre lies on the line $12x - 5y = 70$.

Find an equation of the circle. [5]

Q9.



The diagram shows a circle with centre A passing through the point B . A second circle has centre B and passes through A . The tangent at B to the first circle intersects the second circle at C and D .

The coordinates of A are $(-1, 4)$ and the coordinates of B are $(3, 2)$.

- (a) Find the equation of the tangent CBD . [2]

- (b) Find an equation of the circle with centre B . [3]

- (c) Find, by calculation, the x -coordinates of C and D . [3]
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