Co-ordinate Geometry
Difficulty: Hard

Question Paper 1

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Co-ordinate Geometry
Paper	Paper 4
Difficulty	Hard
Booklet	Question Paper 1

Time allowed: **78 minutes**

Score: **/68**

Percentage: **/100**

Grade Boundaries:

CIE IGCSE Maths (0580)

A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

A line joins the points $A(-3, 8)$ and $B(2, -2)$.

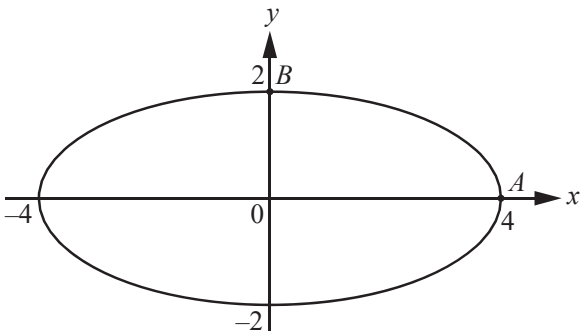
(a) Find the co-ordinates of the midpoint of AB. [2]

(b) Find the equation of the line through A and B.
Give your answer in the form $y = mx + c$. [3]

(c) Another line is parallel to AB and passes through the point (0, 7).

Write down the equation of this line. [2]

(d) Find the equation of the line perpendicular to AB which passes through the point (1, 5).
Give your answer in the form $ax + by + c = 0$ where a, b and c are integers. [4]



NOT TO SCALE

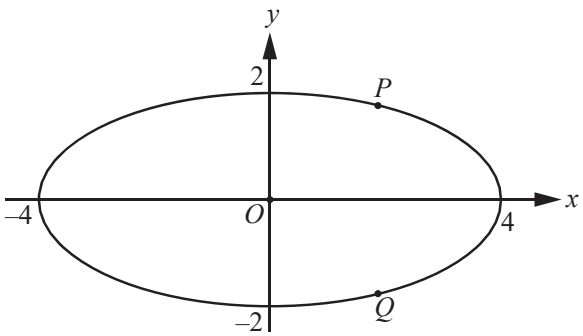
The diagram shows a curve with equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.

(a) A is the point (4, 0) and B is the point (0, 2).

(i) Find the equation of the straight line that passes through A and B.
Give your answer in the form $y = mx + c$. [3]

(ii) Show that $a^2 = 16$ and $b^2 = 4$. [2]

(b)



NOT TO SCALE

$P\,(2, k)$ and $Q\,(2, -k)$ are points on the curve $\frac{x^2}{16} + \frac{y^2}{4} = 1$.

(i) Find the value of k. [3]

(ii) Calculate angle POQ. [3]

(c) The area enclosed by a curve with equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is πab.

(i) Find the area enclosed by the curve $\frac{x^2}{16} + \frac{y^2}{4} = 1$.

Give your answer as a multiple of π. [1]

(ii) A curve, mathematically similar to the one in the diagrams, intersects the x-axis at (12, 0) and (-12, 0).

Work out the area enclosed by this curve, giving your answer as a multiple of π. [2]

A line joins the points A (–2, –5) and B (4, 13).

(a) Calculate the length AB. [3]

(b) Find the equation of the line through A and B.
Give your answer in the form $y = mx + c$.
[3]

(c) Another line is parallel to AB and passes through the point (0, –5).

Write down the equation of this line. [2]

(d) Find the equation of the perpendicular bisector of AB. [5]

A line AB joins the points A (3, 4) and B (5, 8).

(a) Write down the co-ordinates of the midpoint of the line AB. [2]

(b) Calculate the distance AB. [3]

(c) Find the equation of the line AB. [3]

(d) A line perpendicular to AB passes through the origin and through the point $(6, r)$.

Find the value of r. [3]

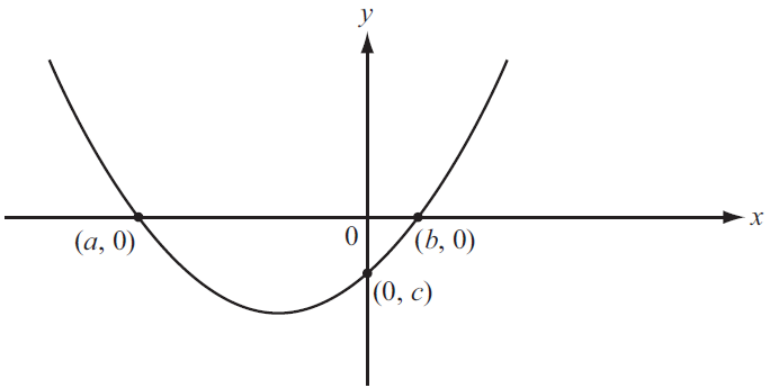
(a) A straight line joins the points (–1, –4) and (3, 8).

(i) Find the midpoint of this line. [2]

(ii) Find the equation of this line.
Give your answer in the form $y = mx + c$. [3]

(b) (i) Factorise $x^2 + 3x - 10$. [2]

(ii) The graph of $y = x^2 + 3x - 10$ is sketched below.

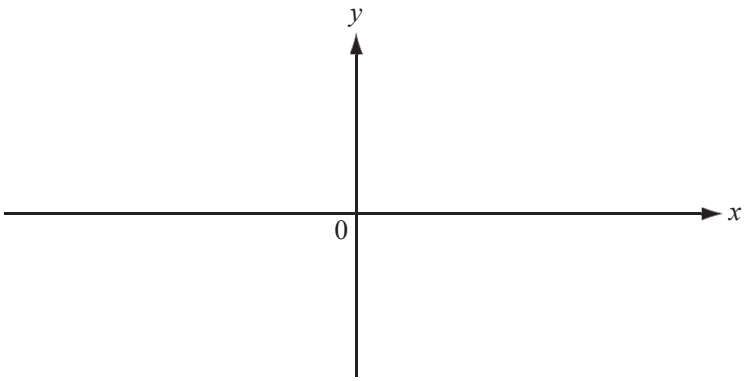


NOT TO SCALE

Write down the values of a, b and c. [3]

(iii) Write down the equation of the line of symmetry of the graph of $y = x^2 + 3x - 10$. [1]

(c) Sketch the graph of $y = 18 + 7x - x^2$ on the axes below.
Indicate clearly the values where the graph crosses the x and y axes. [4]



NOT TO SCALE

(d) (i) $x^2 + 12x - 7 = (x + p)^2 - q$

Find the value of p and the value of q. [3]

(ii) Write down the minimum value of y for the graph of $y = x^2 + 12x - 7$. [1]