Coordinate Geometry
Question Paper 1

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Coordinate Geometry
Sub Topic	
Booklet	Question Paper 1

Time Allowed: **56 minutes**

Score: **/46**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

1
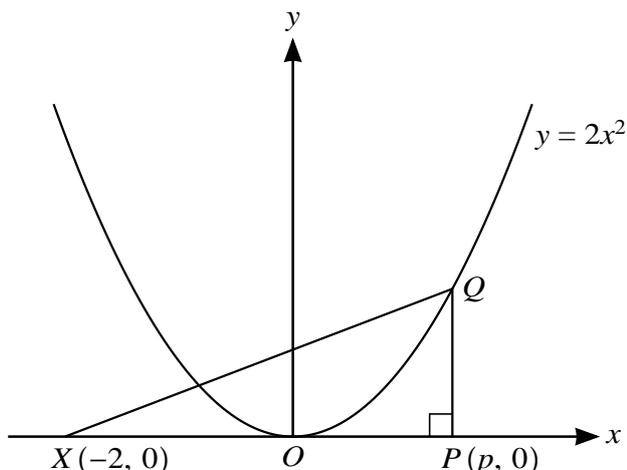
The diagram shows the curve $y = 2x^2$ and the points $X(-2, 0)$ and $P(p, 0)$. The point Q lies on the curve and PQ is parallel to the y-axis.

(i) Express the area, A, of triangle XPQ in terms of p. [2]

The point P moves along the x-axis at a constant rate of 0.02 units per second and Q moves along the curve so that PQ remains parallel to the y-axis.

**(ii)** Find the rate at which A is increasing when $p = 2$. [3]

2   The line with gradient -2 passing through the point $P(3t, 2t)$ intersects the x-axis at A and the y-axis at B.

(i) Find the area of triangle AOB in terms of t. [3]

The line through P perpendicular to AB intersects the x-axis at C.

(ii) Show that the mid-point of PC lies on the line $y = x$. [4]

3   The point C lies on the perpendicular bisector of the line joining the points $A(4, 6)$ and $B(10, 2)$. C also lies on the line parallel to AB through $(3, 11)$.

(i) Find the equation of the perpendicular bisector of AB. [4]

(ii) Calculate the coordinates of C. [3]

4   The point A has coordinates$(p, 1)$ and the point B has coordinates$(9, 3p + 1)$, where p is a constant.

   (i) For the case where the distance AB is 13 units, find the possible values of p.   [3]

   (ii) For the case in which the line with equation $2x + 3y = 9$ is perpendicular to AB, find the value of p.   [4]

5   The line $4x + ky = 20$ passes through the points A $(8, -4)$ and B $(b, 2b)$, where k and b are constants.

   (i) Find the values of k and b.   [4]

   (ii) Find the coordinates of the mid-point of AB.   [1]

6
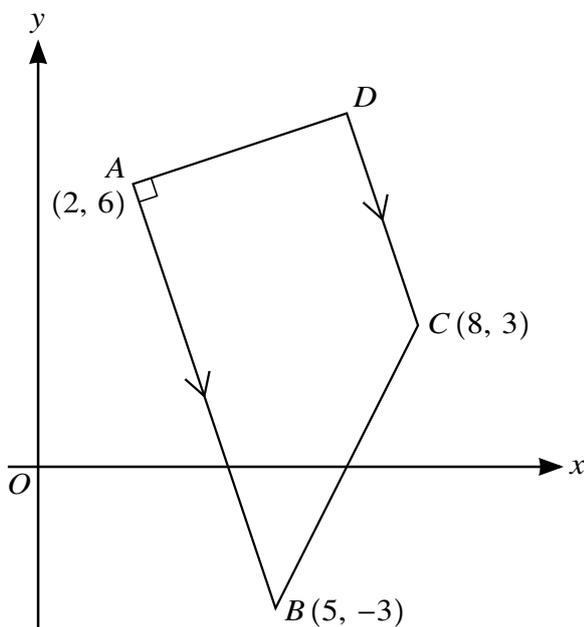
The diagram shows a trapezium $ABCD$ in which AB is parallel to DC and angle BAD is 90°. The coordinates of A, B and C are $(2, 6)$, $(5, -3)$ and $(8, 3)$ respectively.

   (i) Find the equation of AD.   [3]

   (ii) Find, by calculation, the coordinates of D.   [3]

The point E is such that $ABCE$ is a parallelogram.

   (iii) Find the length of BE.   [2]

7   *A* is the point $(a, 2a - 1)$ and *B* is the point $(2a + 4, 3a + 9)$, where *a* is a constant.

   (i) Find, in terms of *a*, the gradient of a line perpendicular to *AB*.   [3]

   (ii) Given that the distance *AB* is $\sqrt{(260)}$, find the possible values of *a*.   [4]