

Equation of the straight line

1Q

The points $A(-4, 8)$, $B(8, 2)$ and $C(6, 13)$ form a triangle ABC . D is the mid point of AB .

- (a) Find the co-ordinates of D . [1]
- (b) Show that CD is perpendicular to AB . [2]
- (c) Find the area of triangle ABC . [3]

2Q

The points $A(0, 6)$, $B(-6, 2)$, $C(2, -10)$ and $D(8, -6)$ are the vertices of a quadrilateral.

- (a) Show the quadrilateral is a rectangle. [3]
- (b) Find the area of the rectangle. [2]

3Q

$ABCD$ is a rectangle. A has co-ordinates $(4, 6)$, B , $(-2, 4)$ and C , $(-1, 1)$.

- (a) Find the equation of AD . [3]
- (b) Find the equation of CD . [2]
- (c) Hence, or otherwise, find the co-ordinates of D . [2]
- (d) Find the area of the rectangle. [2]

4Q

The points $A(-2, 1)$, $B(4, 4)$ and $C(1, -5)$ are the vertices of a triangle.

- (a) Calculate the gradients of AB and AC . Hence show the triangle is right angled, stating which angle is 90° . [3]
- (b) Find the area of the triangle ABC . [2]
- (c) If D and E are the mid points of AB and BC respectively, show DE is parallel to AC . [3]

5Q

AB is the diameter of a circle. A has co-ordinates $(-4, 2)$ and B , $(8, -4)$.

- (a) Find the co-ordinates of the centre of the circle. Also, find the radius of the circle. [3]
- (b) C is a point on the circumference of the circle. The line AC has gradient $\frac{1}{3}$.
 - (i) Find the equation of AC . [2]
 - (ii) Find the equation of BC . [2]
 - (iii) Hence find the co-ordinates of C . [2]

6Q

A triangle has vertices $A(-4, 6)$, $B(-2, 2)$ and $C(4, 4)$.

- (a) Find the equation of L_1 , the perpendicular bisector of AB , (the perpendicular bisector of a line is the line through the mid point, perpendicular to the line) and the equation of L_2 . [4]
- (b) Find the perpendicular bisector of BC . [4]
- (c) Find D , the point of intersection of L_1 and L_2 . [3]

7Q

$A(-8, 10)$, $B(-4, 2)$, $C(8, 8)$ and $D(-4, 12)$ are the vertices of a quadrilateral.

- (a) Draw a sketch of this figure and calculate the gradients of the four sides AB , BC , CD and DA . Are any lines parallel? Are any lines perpendicular? [4]
- (b) Write down the type of quadrilateral you think it is. [1]
- (c) Determine the lengths of sides AB , BC and DA . [2]
- (d) Calculate the area of the quadrilateral. [4]

8Q

$ABCD$ is a quadrilateral in which A has co-ordinates $(-1, 4)$, $B(1, -2)$, $C(5, -4)$ and $D(3, 2)$.

- (a) Find the gradients of the four sides AB , BC , CD and DA . [2]
- (b) Show that diagonal BD is perpendicular to AD . [2]
- (c) State the type of quadrilateral you think it is. [1]
- (d) Find the area of triangle ABD and hence find the area of the quadrilateral. [3]

9Q

ABC is a triangle in which A has co-ordinates $(-2, 2)$, $B(4, -2)$ and $C(5, 6)$

- (a) Show that the triangle ABC is isosceles. [3]
- (b) Find the co-ordinates of D , the mid point of AB . [1]
- (c) Show AB is perpendicular to CD . [2]
- (d) Find the area of triangle ABC . [2]
- (e) A line is drawn through B with gradient $\frac{1}{5}$. This intersects with CD produced. Find the co-ordinates of the point of intersection. [5]

10Q

$ABCD$ is a square. A has co-ordinates $(0, 5)$ and C has co-ordinates $(2, -1)$.

The equation of AB is $2y = -x + 10$.

- (a) Show that the equation of BC is $y = 2x - 5$. [3]
- (b) Find the co-ordinates of B . [3]
- (c) Write down the equations of AD and DC . [2]
- (d) Find the co-ordinates of D . [3]
- (e) A line is drawn from C to the mid point of AD and produced. BA is also produced. Find the co-ordinates of the point of intersection of these lines. [5]