

Miscellaneous exercise 1

- 1 Show that the triangle formed by the points $(-2,5)$, $(1,3)$ and $(5,9)$ is right-angled.
- 2 Find the coordinates of the point where the lines $2x + y = 3$ and $3x + 5y - 1 = 0$ meet.
- 3 A triangle is formed by the points $A(-1,3)$, $B(5,7)$ and $C(0,8)$.
 - (a) Show that the angle ACB is a right angle.
 - (b) Find the coordinates of the point where the line through B parallel to AC cuts the x -axis.
- 4 $A(7,2)$ and $C(1,4)$ are two vertices of a square $ABCD$.
 - (a) Find the equation of the diagonal BD .
 - (b) Find the coordinates of B and of D .
- 5 A quadrilateral $ABCD$ is formed by the points $A(-3,2)$, $B(4,3)$, $C(9,-2)$ and $D(2,-3)$.
 - (a) Show that all four sides are equal in length.
 - (b) Show that $ABCD$ is not a square.
- 6 P is the point $(7,5)$ and l_1 is the line with equation $3x + 4y = 16$.
 - (a) Find the equation of the line l_2 which passes through P and is perpendicular to l_1 .
 - (b) Find the point of intersection of the lines l_1 and l_2 .
 - (c) Find the perpendicular distance of P from the line l_1 .
- 7 Prove that the triangle with vertices $(-2,8)$, $(3,20)$ and $(11,8)$ is isosceles. Find its area.
- 8 The three straight lines $y = x$, $7y = 2x$ and $4x + y = 60$ form a triangle. Find the coordinates of its vertices.
- 9 Find the equation of the line through $(1,3)$ which is parallel to $2x + 7y = 5$. Give your answer in the form $ax + by = c$.
- 10 Find the equation of the perpendicular bisector of the line joining $(2,-5)$ and $(-4,3)$.
- 11 The points $A(1,2)$, $B(3,5)$, $C(6,6)$ and D form a parallelogram. Find the coordinates of the mid-point of AC . Use your answer to find the coordinates of D .
- 12 The point P is the foot of the perpendicular from the point $A(0,3)$ to the line $y = 3x$.
 - (a) Find the equation of the line AP .
 - (b) Find the coordinates of the point P .
 - (c) Find the perpendicular distance of A from the line $y = 3x$.