

- 1 A line L is parallel to $y = 4x + 5$ and passes through the point $(-1, 6)$. Find the equation of the line L in the form $y = ax + b$. Find also the coordinates of its intersections with the axes. [5]
- 2 Find the coordinates of the point of intersection of the lines $y = 5x - 2$ and $x + 3y = 8$. [4]
- 3 A is the point $(1, 5)$ and B is the point $(6, -1)$. M is the midpoint of AB. Determine whether the line with equation $y = 2x - 5$ passes through M. [3]
- 4 Find the equation of the line which is perpendicular to the line $y = 2x - 5$ and which passes through the point $(4, 1)$. Give your answer in the form $y = ax + b$. [3]
- 5 (i) Points A and B have coordinates $(-2, 1)$ and $(3, 4)$ respectively. Find the equation of the perpendicular bisector of AB and show that it may be written as $5x + 3y = 10$. [6]
- (ii) Points C and D have coordinates $(-5, 4)$ and $(3, 6)$ respectively. The line through C and D has equation $4y = x + 21$. The point E is the intersection of CD and the perpendicular bisector of AB. Find the coordinates of point E. [3]
- (iii) Find the equation of the circle with centre E which passes through A and B. Show also that CD is a diameter of this circle. [5]
- 6 Find the equation of the line with gradient -2 which passes through the point $(3, 1)$. Give your answer in the form $y = ax + b$. [3]
- Find also the points of intersection of this line with the axes. [3]

7 Find the set of values of k for which the graph of $y = x^2 + 2kx + 5$ does not intersect the x -axis. [4]

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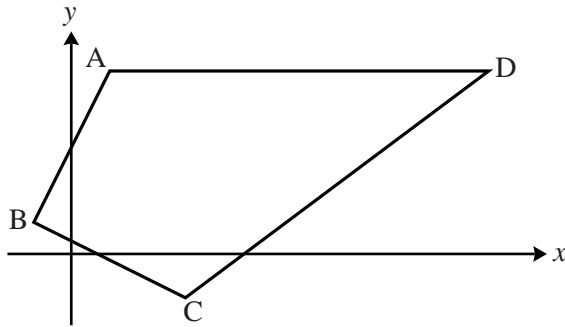


Fig. 10

Fig. 10 is a sketch of quadrilateral ABCD with vertices A (1, 5), B (-1, 1), C (3, -1) and D (11, 5).

(i) Show that $AB = BC$. [3]

(ii) Show that the diagonals AC and BD are perpendicular. [3]

(iii) Find the midpoint of AC. Show that BD bisects AC but AC does not bisect BD. [5]

9 Find the equation of the line which is perpendicular to the line $y = 5x + 2$ and which passes through the point (1, 6). Give your answer in the form $y = ax + b$. [3]