1

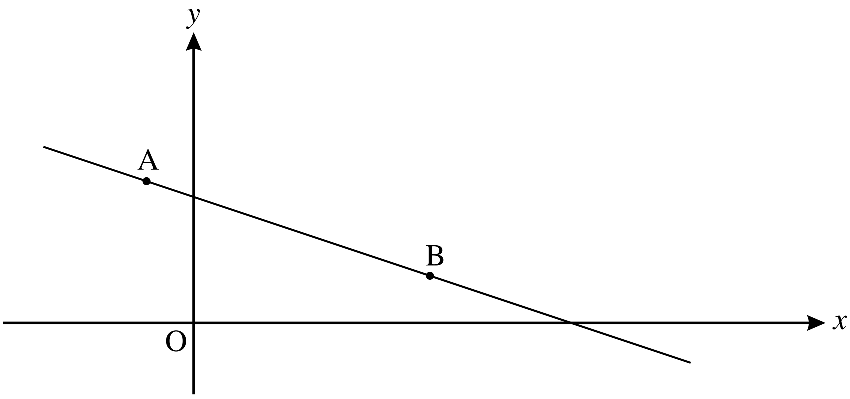

Fig. 11

Fig. 11 shows the line through the points A $(-1, 3)$ and B $(5, 1)$.

(i) Find the equation of the line through A and B. **[3]**

(ii) Show that the area of the triangle bounded by the axes and the line through A and B is $\frac{32}{3}$ square units. **[2]**

(iii) Show that the equation of the perpendicular bisector of AB is $y = 3x - 4$. **[3]**

(iv) A circle passing through A and B has its centre on the line $x = 3$. Find the centre of the circle and hence find the radius and equation of the circle. **[4]**

2 **(i)** Find the coordinates of the point where the line $5x + 2y = 20$ intersects the x-axis. **[1]**

(ii) Find the coordinates of the point of intersection of the lines $5x + 2y = 20$ and $y = 5 - x$. **[3]**

3 Prove that the line $y = 3x - 10$ does not intersect the curve $y = x^2 - 5x + 7$. **[5]**

4

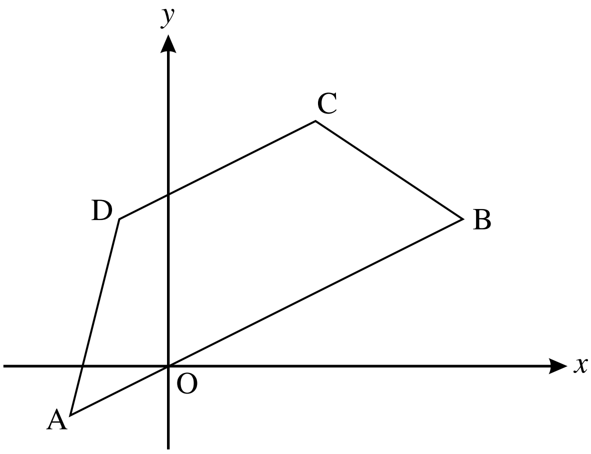

Fig. 10

Fig. 10 shows a trapezium ABCD. The coordinates of its vertices are A $(-2, -1)$, B $(6, 3)$, C $(3, 5)$ and D $(-1, 3)$.

(i) Verify that the lines AB and DC are parallel. **[3]**

(ii) Prove that the trapezium is not isosceles. **[3]**

(iii) The diagonals of the trapezium meet at M. Find the exact coordinates of M. **[4]**

(iv) Show that neither diagonal of the trapezium bisects the other. **[3]**

5 A line has gradient -4 and passes through the point $(2, 6)$. Find the coordinates of its points of intersection with the axes. **[4]**

6

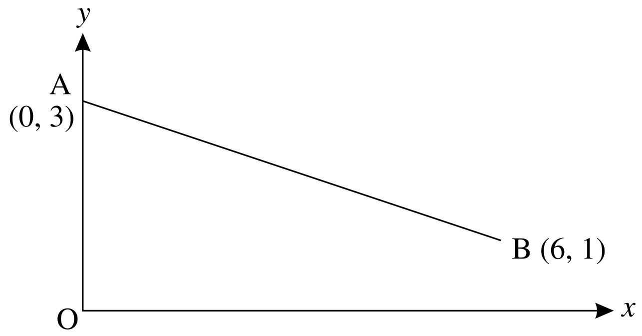

Fig. 11

Fig. 11 shows the line joining the points A (0, 3) and B (6, 1).

(i) Find the equation of the line perpendicular to AB that passes through the origin, O. **[2]**

(ii) Find the coordinates of the point where this perpendicular meets AB. **[4]**

(iii) Show that the perpendicular distance of AB from the origin is $\frac{9\sqrt{10}}{10}$. **[2]**

(iv) Find the length of AB, expressing your answer in the form $a\sqrt{10}$. **[2]**

(v) Find the area of triangle OAB. **[2]**