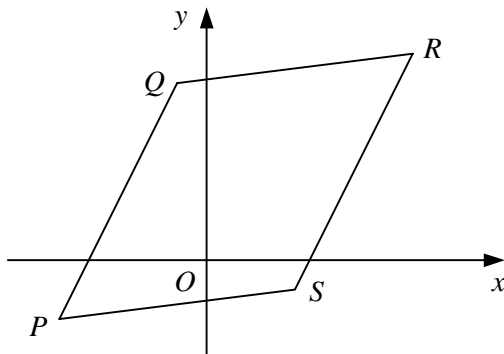


- 1 The straight line l has the equation $y = 1 - 2x$.
The straight line m is perpendicular to l and passes through the point with coordinates $(6, -1)$.
- Find the equation of m in the form $ax + by + c = 0$, where a , b and c are integers. (4)
 - Find the coordinates of the point where l and m intersect. (3)
- 2 The straight line l passes through the point $A(1, -3)$ and the point $B(7, 5)$.
- Find an equation of line l . (3)
- The line m has the equation $4x + y - 17 = 0$ and intersects l at the point C .
- Show that C is the mid-point of AB . (4)
 - Show that the straight line perpendicular to m which passes through the point C also passes through the origin. (4)
- 3 The point A has coordinates $(-2, 7)$ and the point B has coordinates $(4, p)$.
The point M is the mid-point of AB and has coordinates $(q, \frac{9}{2})$.
- Find the values of the constants p and q . (3)
 - Find the equation of the straight line perpendicular to AB which passes through the point A . Give your answer in the form $ax + by + c = 0$, where a , b and c are integers. (5)

4

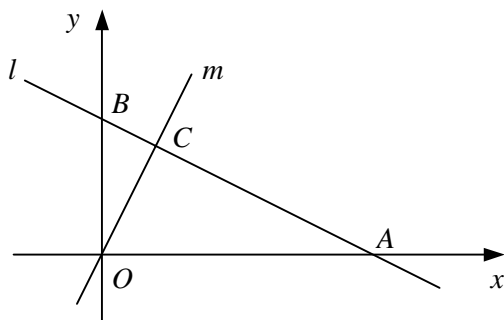


The points $P(-5, -2)$, $Q(-1, 6)$, $R(7, 7)$ and $S(3, -1)$ are the vertices of a parallelogram as shown in the diagram above.

- Find the length of PQ in the form $k\sqrt{5}$, where k is an integer to be found. (3)
 - Find the coordinates of the point M , the mid-point of PQ . (2)
 - Show that MS is perpendicular to PQ . (4)
 - Find the area of parallelogram $PQRS$. (4)
- 5 The straight line l is parallel to the line $2x - y + 4 = 0$ and passes through the point with coordinates $(-1, -3)$.
- Find an equation of line l . (3)
- The straight line m is perpendicular to the line $6x + 5y - 2 = 0$ and passes through the point with coordinates $(4, 4)$.
- Find the equation of line m in the form $ax + by + c = 0$, where a , b and c are integers. (5)
 - Find, as exact fractions, the coordinates of the point where lines l and m intersect. (3)

- 6 The straight line l has gradient $\frac{1}{2}$ and passes through the point with coordinates $(2, 4)$.
- a Find the equation of l in the form $ax + by + c = 0$, where a , b and c are integers. (3)
- The straight line m has the equation $y = 2x - 6$.
- b Find the coordinates of the point where line m intersects line l . (3)
- c Show that the quadrilateral enclosed by line l , line m and the positive coordinate axes is a kite. (4)

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The diagram shows the straight line l with equation $x + 2y - 20 = 0$ and the straight line m which is perpendicular to l and passes through the origin O .

- a Find the coordinates of the points A and B where l meets the x -axis and y -axis respectively. (2)
- Given that l and m intersect at the point C ,
- b find the ratio of the area of triangle OAC to the area of triangle OBC . (5)
- 8 The straight line p has the equation $6x + 8y + 3 = 0$.
- The straight line q is parallel to p and crosses the y -axis at the point with coordinates $(0, 7)$.
- a Find the equation of q in the form $y = mx + c$. (2)
- The straight line r is perpendicular to p and crosses the x -axis at the point with coordinates $(1, 0)$.
- b Find the equation of r in the form $ax + by + c = 0$, where a , b and c are integers. (4)
- c Show that the point where lines q and r intersect lies on the line $y = x$. (4)
- 9 The vertices of a triangle are the points $P(3, c)$, $Q(9, 2)$ and $R(3c, 11)$ where c is a constant.
- Given that $\angle PQR = 90^\circ$,
- a find the value of c , (5)
- b show that the length of PQ is $k\sqrt{10}$, where k is an integer to be found, (3)
- c find the area of triangle PQR . (4)
- 10 The straight line l_1 passes through the point $P(1, 3)$ and the point $Q(13, 12)$.
- a Find the length of PQ . (2)
- b Find the equation of l_1 in the form $ax + by + c = 0$, where a , b and c are integers. (4)
- The straight line l_2 is perpendicular to l_1 and passes through the point $R(2, 10)$.
- c Find an equation of line l_2 . (3)
- d Find the coordinates of the point where lines l_1 and l_2 intersect. (3)
- e Find the area of triangle PQR . (3)