The straight line l has equation $2x - 3y + 24 = 0$ and meets the coordinate axis at the points A and B.

Find the distance of the midpoint of AB from the origin.

Give your answer in the form $k\sqrt{13}$

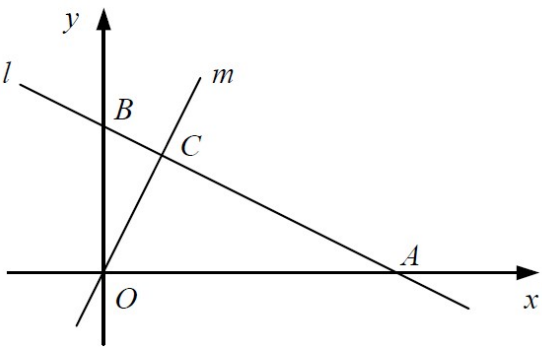
The points A and B have coordinates $(-1, k + 2)$ and $(2k - 3, 8)$ where k is a constant.

Given the gradient of AB is $\frac{1}{3}$

(a) Show that $k = 4$ **(2)**

(b) Find the equation of the line the passes through A and B. **(3)**

(c) Find the equation of the perpendicular bisector of A and B. **(4)**
Give your answer in the form $ax + by + c = 0$



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)**

The straight line l passes through the points $A\ (1,\ 2\sqrt{3}\ )$ and $B\ (\sqrt{3}\ ,\ 6)$.

a Find the gradient of l in its simplest form.

b Show that l also passes through the origin.

c Show that the straight line which passes through A and is perpendicular to l has equation

$$x + 2\sqrt{3}\,y - 13 = 0.$$

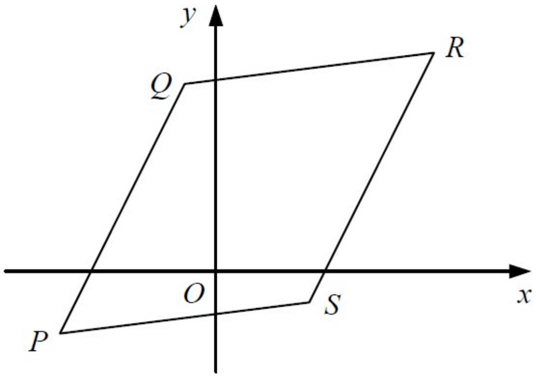
The vertices of a triangle are the points P (3, c), Q (9, 2) and R (3c, 11) where c is a constant.

Given that $\angle PQR = 90°$,

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)**



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.

a Find the length of PQ in the form $k\sqrt{5}$, where k is an integer to be found. **(3)**

b Find the coordinates of the point M, the mid-point of PQ. **(2)**

c Show that MS is perpendicular to PQ. **(4)**

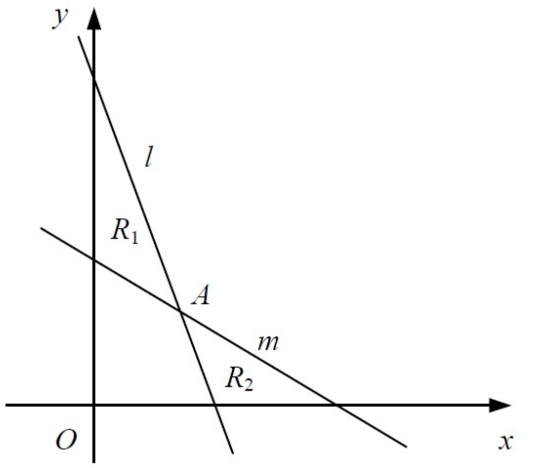
d Find the area of parallelogram $PQRS$. **(4)**

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 $(q, \frac{9}{2})$.

a Find the values of the constants p and q. **(3)**

b 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)**



The line l with equation $3x + y - 9 = 0$ intersects the line m with equation $2x + 3y - 12 = 0$ at the point A as shown in the diagram above.

a Find, as exact fractions, the coordinates of the point A.

The region R_1 is bounded by l, m and the y-axis.

The region R_2 is bounded by l, m and the x-axis.

b Show that the ratio of the area of R_1 to the area of R_2 is $25 : 18$

The point A has coordinates $(-8, 1)$ and the point B has coordinates $(-4, -5)$.

a Find the equation of the straight line passing through A and B, giving your answer in the form $ax + by + c = 0$, where a, b and c are integers.

b Show that the distance of the mid-point of AB from the origin is $k\sqrt{10}$ where k is an integer to be found.

The straight line l_1 has gradient $\frac{1}{3}$ and passes through the point with coordinates $(-3, 4)$.

a Find the equation of l_1 in the form $ax + by + c = 0$, where a, b and c are integers.

The straight line l_2 has the equation $5x + py - 2 = 0$ and intersects l_1 at the point with coordinates $(q, 7)$.

b Find the values of the constants p and q.

The straight line l passes through the point A $(1, -3)$ and the point B $(7, 5)$.

a Find an equation of line l. **(3)**

The line m has the equation $4x + y - 17 = 0$ and intersects l at the point C.

b Show that C is the mid-point of AB. **(4)**

c Show that the straight line perpendicular to m which passes through the point C also passes through the origin. **(4)**

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)**