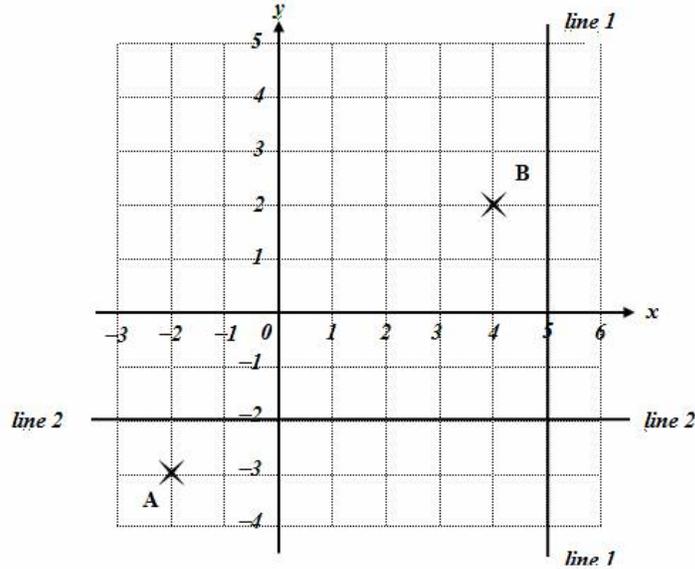


Revision Paper 15: Graphs and Coordinate Geometry

- Linear Graphs
- Quadratic Graphs
- Coordinate Geometry

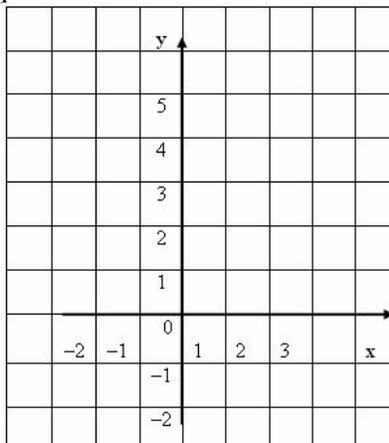
Q1 (a) Write down the coordinates of A and B .



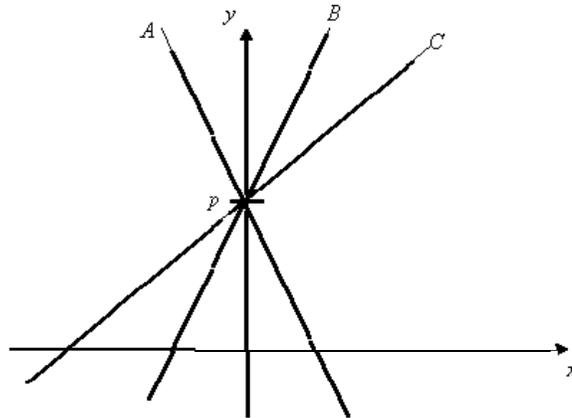
- (b) Plot and label the following points on the graph provided above: Point $C(2, 4)$ and Point $D(-1, 3)$.
- (c) State the equations of the following lines:
- $line\ 1$,
 - $line\ 2$.
- (d) Plot and label the following lines on the graph provided above:
- $x = 3$
 - $y = 1$

Q2 The points D , E and F have coordinates $(3, -2)$, $(3, 5)$ and $(-1, 5)$ and respectively.

- Mark the points D , E and F on the axes provided below.
- Draw the line $x = 1$.
- Mark the points G so that $DEFG$ is symmetrical about the line $x = 1$.
- State the name of the quadrilateral $DEFG$.



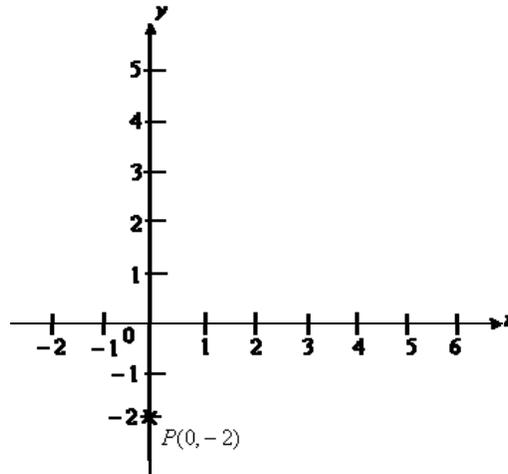
Q3



The equations of the graphs shown below are $y = x + 3$, $y = 2x + 3$ and $y = -2x + 3$.

- Identify graphs A, B and C.
- Find the value of p .
- Sketch the graph of $y = x$ in the diagram below.

Q4

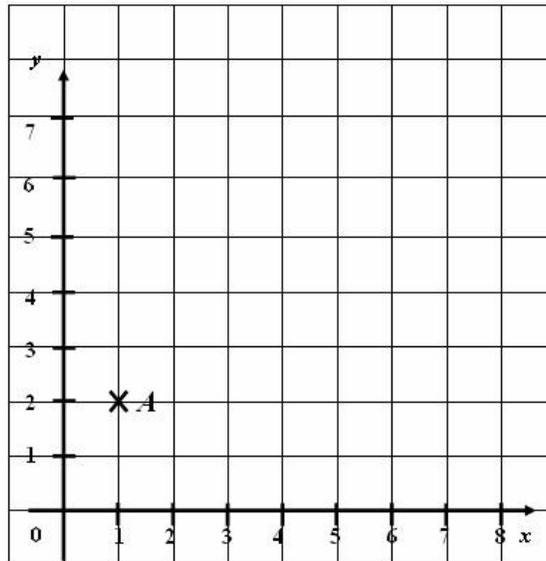


- The grid above shows the point $P(0, -2)$. Plot and label the points $Q(-2, 2)$ and $R(3, 2)$.
- Calculate the area of $\triangle PQR$.
- Given that $PQRS$ is a parallelogram such that PS is parallel to QR , mark accurately the point S in the grid and state the coordinates of S .
- Write down the gradient of the line PQ .
- In the same grid, draw the graph of the linear function $y = x - 2$.

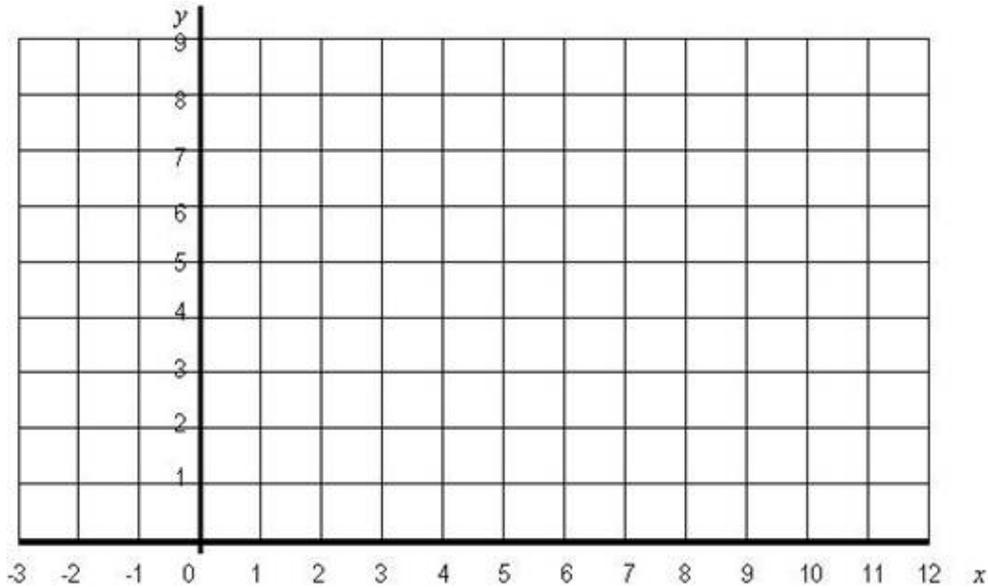
Q5

The point A is marked on the grid below.

- Write down the coordinates of the point A.
- B is the point $(7, 5)$.
 - Plot the point B on the grid below and draw the line AB .
 - Find the equation of line AB .
 - Find the distance AB .
- Write down the coordinates of the point where the line AB meets the line $x = 5$.



Q6



- On the diagram above, plot and label the points **A(-1, 1)**, **B(2, 8)** and **C(9, 8)**.
- Draw the triangle **ABC**. Write down the order of rotational symmetry of the triangle.
- Calculate the area of the triangle.
- D** is a new point. The parallelogram has one two lines of symmetry, **AC** and **BC**. Write down the coordinate of the point **D**.
- Calculate the area of the trapezium of the point **ABCD**.

Q7 The table below gives some values of x and the corresponding values of y , where **$y = -2x - 1$** .

x	-3	-2	-1	0	1	2	3
y	a	3	b	-1	c	5	d

- Find the values of a , b , c and d .
- Using a scale of 2 cm to 1 unit, draw a horizontal x -axis for **$-3 \leq x \leq 3$** .
Using a scale of 1 cm to 1 unit, draw a vertical y -axis for **$-8 \leq y \leq 6$** .

On your axes, plot the points given in the table and join them with a straight line.

On the same axes, draw the graph of

(c) (i) $y = -3$,

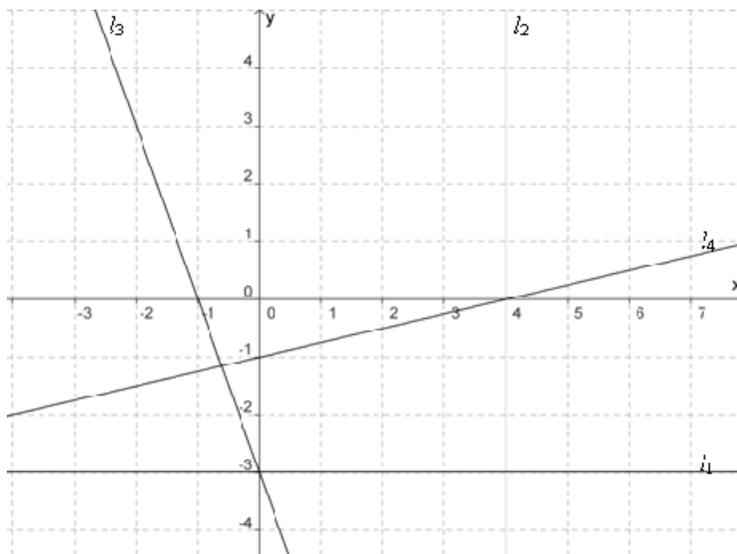
(ii) $x = 2$,

(iii) $y = -6x$,

(iv) $2y = \frac{1}{2}x + 4$.

(d) Write down the coordinates of the point of intersection of the graphs of $y = -2x - 1$ and $y = -6x$.

Q8

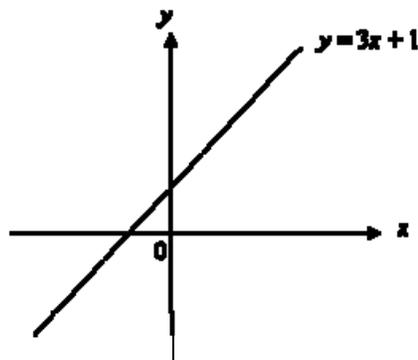


- State the equations of the lines shown in the diagram.
- Find the equation of the line parallel to l_4 and passing through the point (4, 3).
- Find the equation of the line which is perpendicular to l_3 passing through the point (3, 4).
- Sketch on another diagram the graph of the lines $y = x$ and $x + y = 2$, showing their x -intercept and y -intercept clearly.

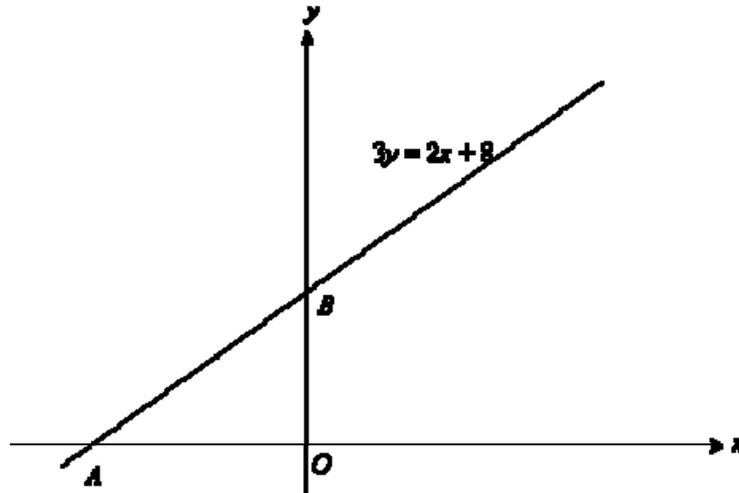
Q9 The graph of the line $y = 3x + 1$ is shown in the answer spaces. On the same diagram, indicating the y -intercept clearly, sketch the graphs of

(a) $y = 3x$,

(b) $y = 1 - 3x$.



Q10



The figure shows the graph of $3y = 2x + 8$. The line cuts the x -axis at A and the y -axis at B .

- (a) Find the coordinates of A and B ,
- (b) Find the area of $\triangle AOB$.

Q11 Using 2 cm to 1 unit, draw a horizontal x -axis for $0 \leq x \leq 7$. Using 2 cm to 1 unit, draw a vertical y -axis for $0 \leq y \leq 10$.

- (a) Plot, on the same diagram, the graphs of $y = -x + 6$ and $3x + 2y = 18$.
- (b) From your graph, find the solution to the simultaneous equations.

$$y = -x + 6$$

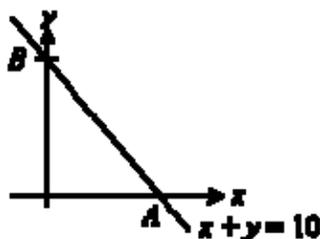
$$3x + 2y = 18$$

- (c) Label the point where $y = -x + 6$ and $3x + 2y = 18$ intersect each other as A .
Label the point where $y = -x + 6$ intersects the y -axis as B .
Label the point where $3x + 2y = 18$ intersects the y -axis as C .
- (d) Find

- (i) the area of $\triangle ABC$,

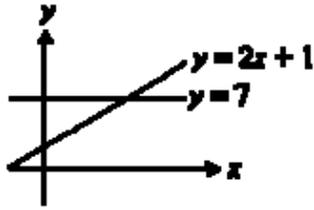
- (ii) $\frac{\text{area of } \triangle OAB}{\text{area of } \triangle OAC}$.

Q12



The line $x + y = 10$ cuts the x -axis at A and the y -axis at B . Find the coordinates of A and of B .

Q13



The line $y = 2x + 1$ meets another line $y = 7$ at the point (p, q) . What is the value of p and q ?

Solve the following simultaneous equations using the graphical method

Q14 $y = -2x + 4$ and $2x - y = 12$

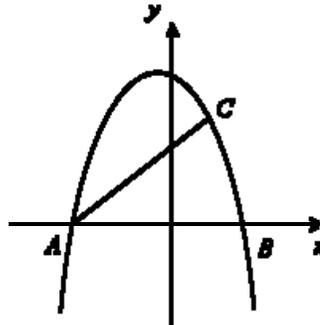
$y = 2x + 1$

$y = 10 - x$

Q16 $y = \frac{x-2}{3}$

Q15 $y = 2x + 6$

- Q17 The curve of $y = (4-x)(x+5)$ cuts the x -axis at A and B . A straight line cuts the curve at A and at C . The x -coordinate of C is 2. Find
- the coordinates of point C ,
 - the equation of the line AC ,
 - the area of $\triangle ABC$.

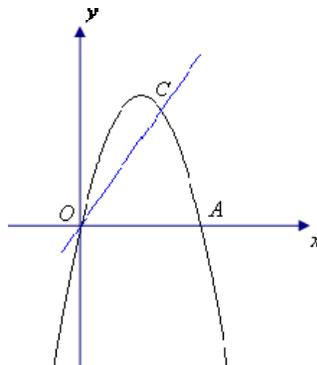


Q18 Sketch the following graphs and indicate clearly the x -intercept(s), y -intercept and turning point (if applicable) in each case.

(a) $y = -2x + 3$

(b) $y = (x+3)(x-4)$

Q19



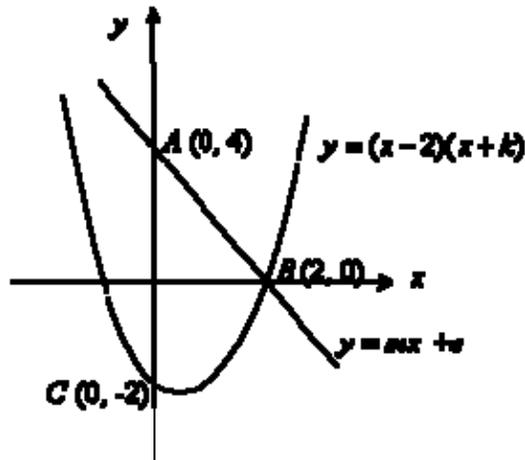
The curve $y = x(6-x)$ cuts the x -axis at the origin and at the point A .

- Write down the coordinates of A .
- Describe completely the symmetry of the curve $y = x(6-x)$.
- The gradient of the line OC is 2.
 - Find the coordinates of C .
 - Find equation of the line which is parallel to OC and which passes through $(-4, 2)$.
 - D is the point $(k, 12)$. Find the value of k such that O, C and D are *collinear*.

Q20 Sketch the graph of $y = (3-x)(5+x)$.

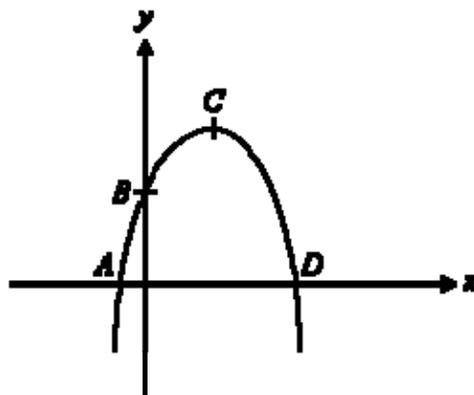
Q21 Sketch the graph of $y = (x-3)(x+2)$.

Q22 The diagram shows a straight line $y = mx + c$ cutting the y -axis at $A(0, 4)$ and x -axis at $B(2, 0)$. A curve $y = (x-2)(x+k)$ meets the x -axis at B and the y -axis at $C(0, -2)$.



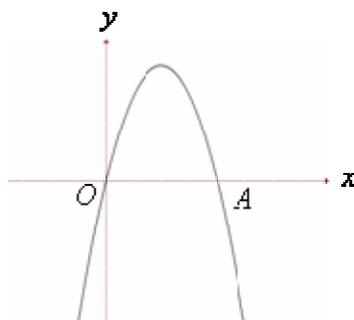
- Find the values of m and c .
- Find the length of AB .
- Find the value of k .
- Write down the equation of the axis of symmetry of the curve $y = (x-2)(x+k)$.

Q23



The curve $y = (x+1)(5-x)$ cuts the x -axis at points A and D , and the y -axis at B . C is the maximum point. Write down the coordinates of A, B, C and D .

Q24

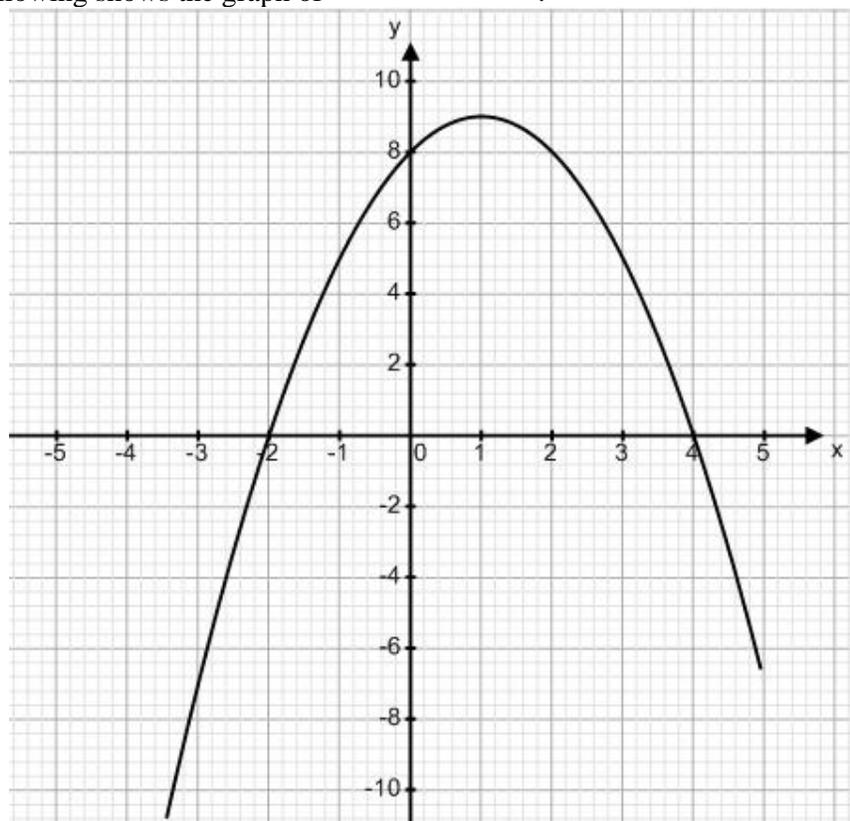


The graph of $y = 6x - 2x^2$ passes through the origin, O , and then crosses the x -axis at point A again.

- (a) Find the coordinates of A .
- (b) Write down the equation of the line of symmetry.
- (c) Hence, or otherwise, find the coordinates of the maximum point of this graph.

(d) Find the points of intersection of the graph $y = 6x - 2x^2$ and $\frac{y}{2} = -3x + 8$.

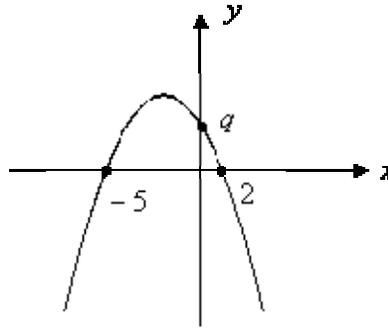
Q25 The following shows the graph of $y = -x^2 + 2x + 8$.



State

- (a) the maximum value of the graph,
- (b) the equation of the line of symmetry,
- (c) the values of x for $y = 4$,
- (d) the value of y when $x = 2$,
- (e) the coordinates of the point where the curve cuts the y -axis.

Q26



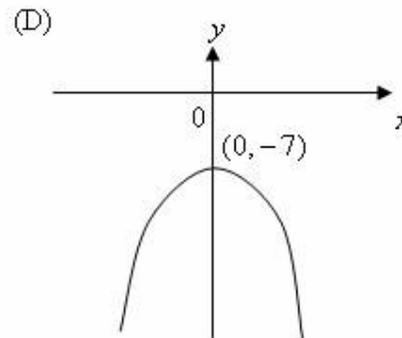
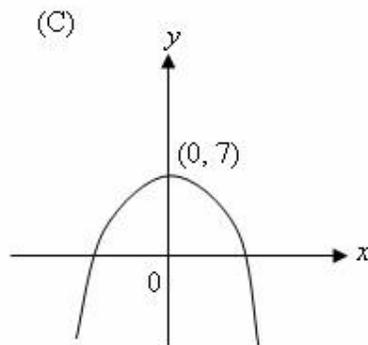
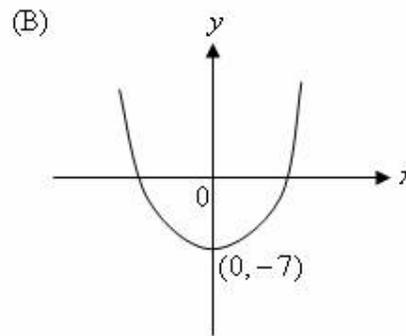
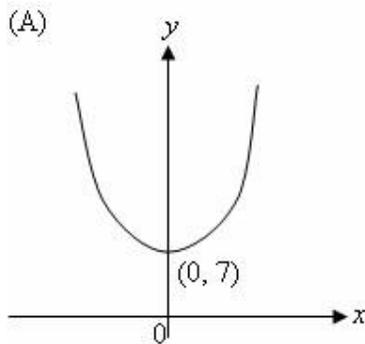
The diagram shows the graph of $y = -(x+5)(x+p)$.

- (a) Find the value of
- (i) p ,
 - (ii) q .
- (b) Write down the equation of the line of symmetry of this graph.

Q27 Sketch the following graphs and indicate clearly the x -intercept(s), y -intercept and turning point (if applicable) in each case.

- (a) $y = -4x + 5$,
- (b) $y = -6x^2 + 1$,
- (c) $y = (x-3)(x+4)$.

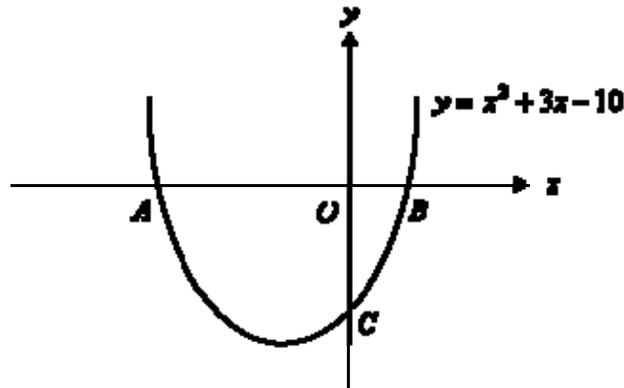
Q28



Write a suitable equation for each of the graphs above.

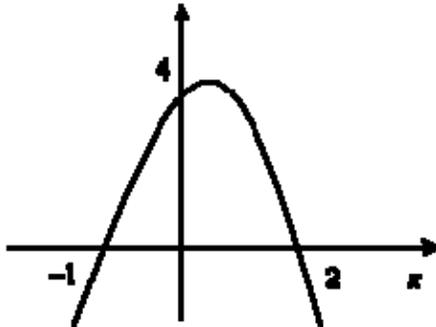
- Q29 Sketch the graph of $y = (3-2x)(5-2x)$ and indicate clearly the x -intercept(s), y -intercept and turning point.
State the equation of the line of symmetry.

- Q30 The diagram below shows the sketch of the graph $y = x^2 + 3x - 10$.



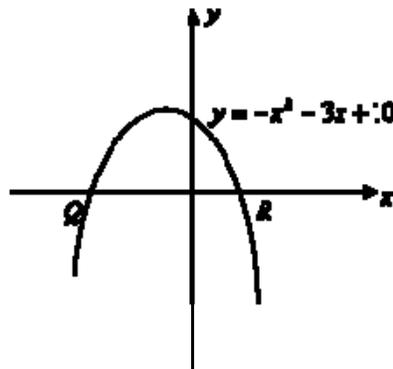
Find the coordinates of A , B and C .

- Q31 The diagram shows a quadratic curve which can be expressed in the form of $y = ax^2 + bx + c$. Given that the curve cuts the x -axis at -1 and 2 and the y -axis at 4 , find the values of a , b and c .



- Q32 Sketch $y = (x-2)^2 + 5$ and indicate clearly the x -intercept(s) if any, y -intercept and turning point.
- Q33 The graph of $y = (x-4)^2 - 9$ cuts the x -axis at points A and B . It cuts the y -axis at C .
- Find the coordinates of points A , B and C .
 - Find the coordinates of the maximum/minimum point.
 - Sketch the graph of $y = (x-4)^2 - 9$, showing clearly points A , B and C .

Q34



The diagram above shows the curve $y = -x^2 - 3x + 10$.

- (a) Calculate the coordinates of the points Q and R .
 (b) Find the greatest value of y .

Q35 Find the distance between the points **$(-2, 5)$** and $(6, 10)$.

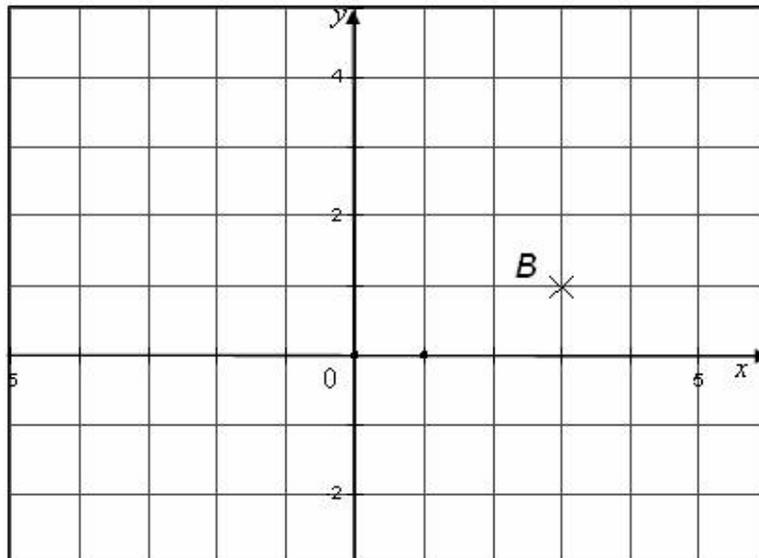
- Q36 (a) A line l passes through the points **$A(-8, 3)$** and $B(4, 13)$. Find
 (i) the mid point of AB ,
 (ii) the length of AB .
 (b) Another line m passes through the point $(12, 5)$ and is parallel to line l .
 Find the equation of line m .

- Q37 The coordinates of point P and Q are $(a, 3a)$ and **$(-7, 5)$** respectively. Given that point P lies on the line $2y = x + 5$, find
 (a) the value of a .
 (b) the midpoint of PQ .

Q38 Write down an expression in terms of p , for the gradient of the line joining the points $(4, 1)$ and $(6, p)$. Hence, find the value of p if the gradient is $\frac{3}{5}$.

- Q39 Given four points $A(1, 3)$, $B(3, 7)$, $C(6, 1)$ and **$D(-2, -15)$** ,
 (a) find the gradient of AB and CD ,
 (b) What conclusion can be made about the two lines AB and CD ?

Q40

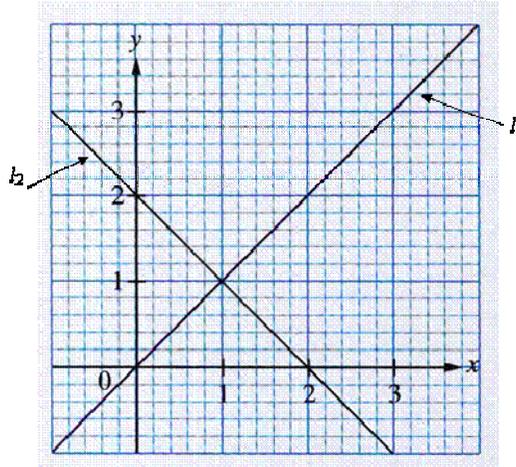


Given points A and B . Point A is **$(-2, 1)$** and point B is shown on the grid.

- (a) Plot point A on the grid given.
 (b) Write down the coordinates of B .
 (c) Find the gradient of the line AB .
 (d) Find the equation of the line AB .
 (e) C is the point **$(-2, -2)$** . Find the area of triangle ABC .
 (f) Find the distance AC .

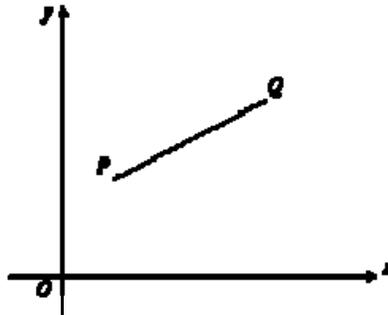
Q41 From the grid given below, find the gradient of

- (a) line l_1 ,
- (b) line l_2 .



Q42 The line ST has gradient 0.5. If (p, q) and $(3, 5)$ lie on the line ST , find the equation relating p and q .

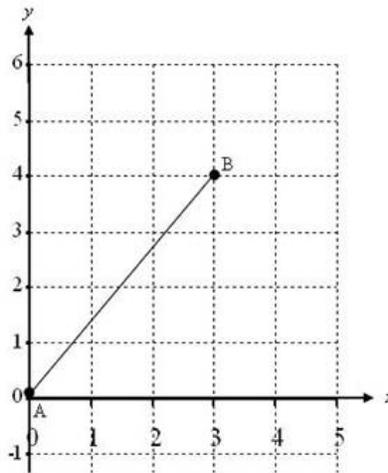
Q43



In the diagram, O is the origin and the points P and Q have coordinates $(3,5)$ and $(9, 11)$.

- (a) calculate the length of PQ ,
- (b) calculate the gradient of the line PQ ,
- (c) find the equation of the line PQ .
- (d) find the equation of another line that is parallel to PQ and goes through the origin

Q44



In the diagram above, the points A and B have coordinates (0,0) and (3,4).

- (a) Calculate the gradient of the line AB.
- (b) Find the equation of the line AB.
- (c) Find the length of AB

Q45 A line L , drawn parallel to another line $3y = -x + 2$, passes through the point $P(-2, 3)$ and intersects the x -axis at point G .

- (a) Find the coordinates of G .
- (b) Calculate the length of FG .

Q46 The points P and Q have coordinates $(-8, 4)$ and $(0, 6)$ respectively.

- (a) Find the coordinates of the midpoint M of PQ .
- (b) Find the equation of the line PQ .

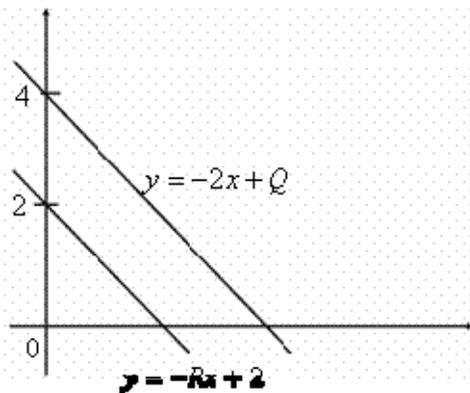
If the line PQ intersects the curve $y = -x^2 - kx + 2$ at M and N , calculate

- (c) the value of k ,
- (d) the coordinates of N .

Q47 The straight line passes through the points $A(8, -2)$ and $B(-6, 5)$.

- (i) Find the gradient of AB .
- (ii) Find the equation of the line parallel to AB and passes through the point $C(7, -9)$.
- (iii) The line in (b) cuts the x -axis at P and the y -axis at Q . Find the coordinates of P and Q .
- (iv) Find the length of PQ .

Q48 The two graphs shown are parallel. Calculate the values of Q and R .



Q49 Points $A(-1, 0)$, $B(1, 3)$, and $C(2, 4)$ lie on a graph.

- (a) Find the gradient of
 - (i) AB ,
 - (ii) BC .
- (b) Hence, explain why points A , B and C lie on a same straight line.

Q50 Given that $(2, 0)$, $(6, -3)$ and $(8, k)$ are *collinear*, find the value of k .