1 Find the gradient of the straight line with equation $5x + 2y = 7$

.....

(Total for Question 1 is 2 marks)

2 P and Q are two points.

The coordinates of P are $(-1, 6)$

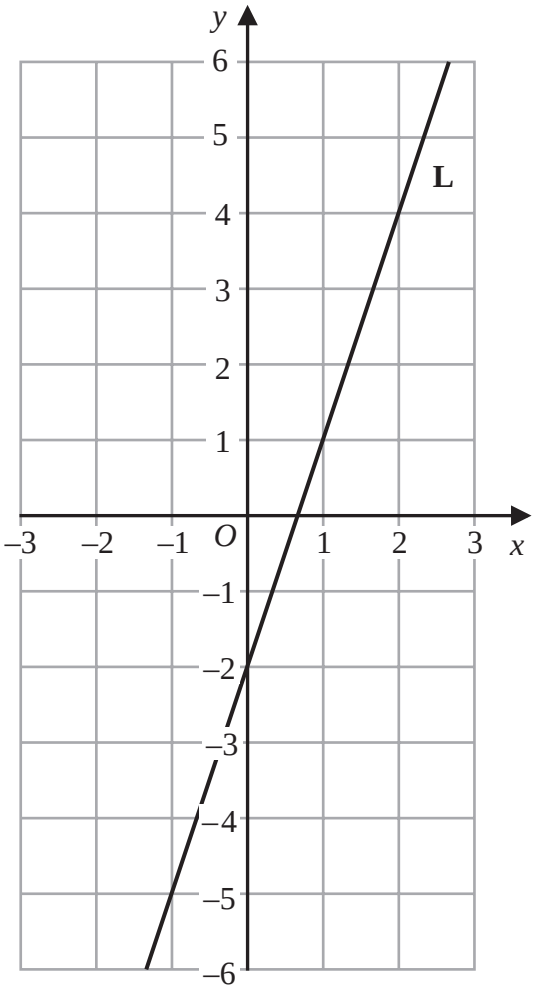
The coordinates of Q are $(5, -4)$

Find an equation of the perpendicular bisector of PQ.
Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

.....

(Total for Question 2 is 6 marks)

3 The line **L** is shown on the grid.



Find an equation for **L**.

.....

(Total for Question 3 is 2 marks)

4 $\mathbf{L}_1$ and $\mathbf{L}_2$ are two straight lines.
The origin of the coordinate axes is O.

$\mathbf{L}_1$ has equation $5x + 10y = 8$
$\mathbf{L}_2$ is perpendicular to $\mathbf{L}_1$ and passes through the point with coordinates (8, 6)

$\mathbf{L}_2$ crosses the x-axis at the point A.
$\mathbf{L}_2$ intersects the straight line with equation $x = -3$ at the point B.

Find the area of triangle AOB.
Show your working clearly.

.....

(Total for Question 4 is 5 marks)

5 Line **L** has equation $y = 2 - 3x$

(b) Write down the gradient of line **L**.

.....

(1)

(Total for Question 5 is 1 marks)

6 Triangle HJK is isosceles with $HJ = HK$ and $JK = \sqrt{80}$

H is the point with coordinates $(-4, 1)$
J is the point with coordinates $(j, 15)$ where $j < 0$
K is the point with coordinates $(6, k)$

M is the midpoint of JK.
The gradient of HM is 2

Find the value of j and the value of k.

j = ...

k = ...

(Total for Question 6 is 6 marks)

7 (a) Write down an equation of a line that is parallel to the line with equation $y = 7 - 4x$

.....

(1)

The line **L** passes through the points with coordinates (–3, 1) and (2, –2)

(b) Find an equation of the line that is perpendicular to **L** and passes through the point with coordinates (–6, 4)
Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

.....

(4)

(Total for Question 7 is 5 marks)

8 The straight line **L** passes through the points (4, −1) and (6, 4)

The straight line **M** is perpendicular to **L** and intersects the *y*-axis at the point (0, 8)

Find the coordinates of the point where **M** intersects the *x*-axis.

(..... , ...)

(Total for Question 8 is 4 marks)

9 ABC is an isosceles triangle with $AB = AC$.

B is the point with coordinates $(-1, 5)$
C is the point with coordinates $(2, 10)$
M is the midpoint of BC.

Find an equation of the line through the points A and M.
Give your answer in the form $py + qx = r$ where p, q and r are integers.

.....

(Total for Question 9 is 5 marks)

10 Point A has coordinates (5, 8)
Point B has coordinates (9, –4)

(a) Work out the gradient of AB.

.....

(2)

(Total for Question 10 is 2 marks)

11 A rectangle *ABCD* is to be drawn on a centimetre grid such that

A has coordinates (–4, –2)
B has coordinates (1, 10)
C has coordinates (19, *a*)
D has coordinates (*b*, *c*)

(a) Work out the value of *a*, the value of *b* and the value of *c*.

a = ...

b = ...

c = ...

(4)

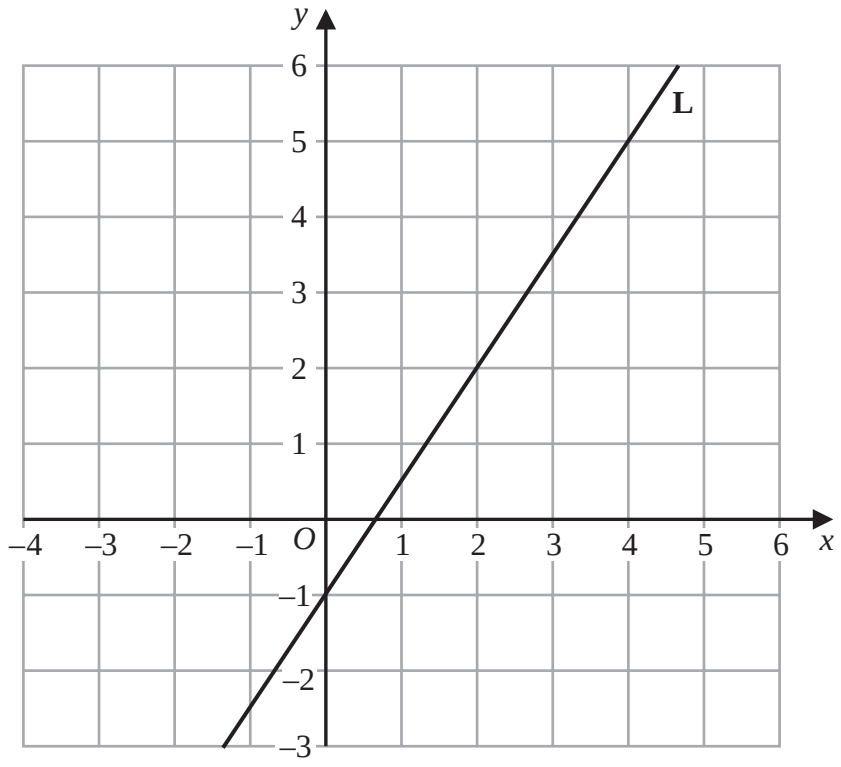
(b) Calculate the perimeter, in centimetres, of rectangle *ABCD*.

..... cm

(3)

(Total for Question 11 is 7 marks)

12 Line **L** is drawn on the grid.



Find an equation for **L**
Give your answer in the form $y = mx + c$

.....

(Total for Question 12 is 3 marks)

13 *ABCD* is a kite, with diagonals *AC* and *BD*, drawn on a centimetre square grid, with a scale of 1 cm for 1 unit on each axis.

A is the point with coordinates (−3, 4)

The diagonals of the kite intersect at the point *M* with coordinates (0, 2)

Given that $AB = AD = 6.5$ cm and the x coordinate of *B* is positive,

find the coordinates of the points *B* and *D*.

(..... , ...)

(..... , ...)

(Total for Question 13 is 7 marks)

14 ABC is a triangle in which angle $ABC = 90°$

p and q are integers such that

the coordinates of A are $(p, 10)$
the coordinates of B are $(-1, -5)$
the coordinates of C are $(8, q)$

Given that the gradient of AC is $-\frac{6}{7}$

work out the value of p and the value of q

p = ...

q = ...

(Total for Question 14 is 5 marks)

15 The straight line **L** has equation $2y + 7x = 10$

(a) Find the gradient of **L**

.....

(2)

(b) Find the coordinates of the point where **L** crosses the y-axis.

(..... , ...)

(1)

(Total for Question 15 is 3 marks)

16 G is the point on the curve with equation $y = 8x^2 - 14x - 6$ where the gradient is 10
The straight line **Q** passes through the point G and is perpendicular to the tangent at G

Find an equation for **Q**
Give your answer in the form $ax + by + c = 0$ where a, b and c are integers.

.....

(Total for Question 16 is 5 marks)

17 *ABCD* is a trapezium with *AB* parallel to *DC*

A is the point with coordinates (–4, 6)
B is the point with coordinates (2, 3)
D is the point with coordinates (–1, 8)

The trapezium has one line of symmetry.
The line of symmetry intersects *CD* at the point *E*

Work out the coordinates of the point *E*

(..... , ...)

(Total for Question 17 is 6 marks)

18 *ABCD* is a kite.

AB = *AD* and *CB* = *CD*

The point *B* has coordinates (*k*, 1) where *k* is a negative constant.
The point *D* has coordinates (8, 7)

The straight line **L** passes through the points *B* and *D*

The straight line **L** is parallel to the line with equation $5y - 3x = 6$

Find an equation of *AC*
Give your answer in the form $px + qy = r$ where *p*, *q* and *r* are integers.
Show your working clearly.

.....

(Total for Question 18 is 6 marks)

19 The straight line with equation $y - 2x = 7$ is the perpendicular bisector of the line AB where A is the point with coordinates $(j, 7)$ and B is the point with coordinates $(6, k)$

Find the coordinates of the midpoint of the line AB
Show clear algebraic working.

(..... , ...)

(Total for Question 19 is 6 marks)

20 *A* is the point with coordinates (–5, 12)

B is the point with coordinates (19, –48)

Find an equation of the straight line that passes through the points *A* and *B*

.....

(Total for Question 20 is 3 marks)

21 $ABCD$ is a kite with $AB = AD$ and $CB = CD$

A is the point with coordinates $(-2, 10)$

B is the point with coordinates $\left(-\frac{27}{5}, 4\right)$

C is the point with coordinates $(4, -5)$

Work out the coordinates of D

(..... , ...)

(Total for Question 21 is 6 marks)