1. The diagram below shows the line PQ, whose equation is $x + 2y = 12$. The line intercepts the axes at P and Q respectively.
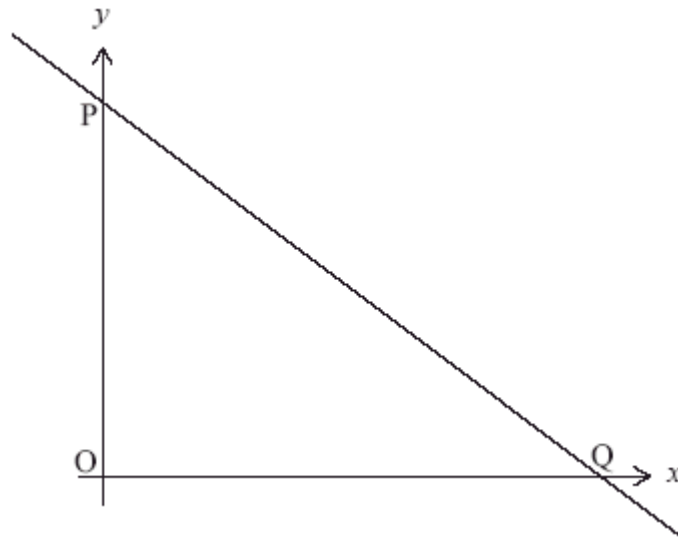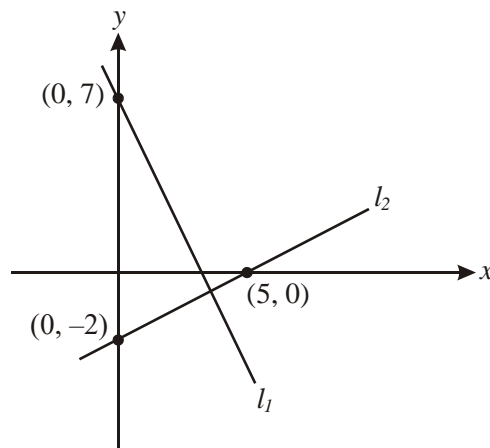

diagram not to scale

(a) Find the coordinates of P and of Q.

(3)

(b) A second line with equation $x - y = 3$ intersects the line PQ at the point A. Find the coordinates of A.

(3)
(Total 6 marks)

2. The following diagram shows the lines l_1 and l_2, which are perpendicular to each other.

Diagram not to scale

(a) Calculate the gradient of line l_1.

(b) Write the equation of line l_1 in the form $ax + by + d = 0$ where a, b and d are integers, and $a > 0$.

(Total 8 marks)

3. A student has drawn the two straight line graphs L_1 and L_2 and marked in the angle between them as a right angle, as shown below. The student has drawn one of the lines incorrectly.
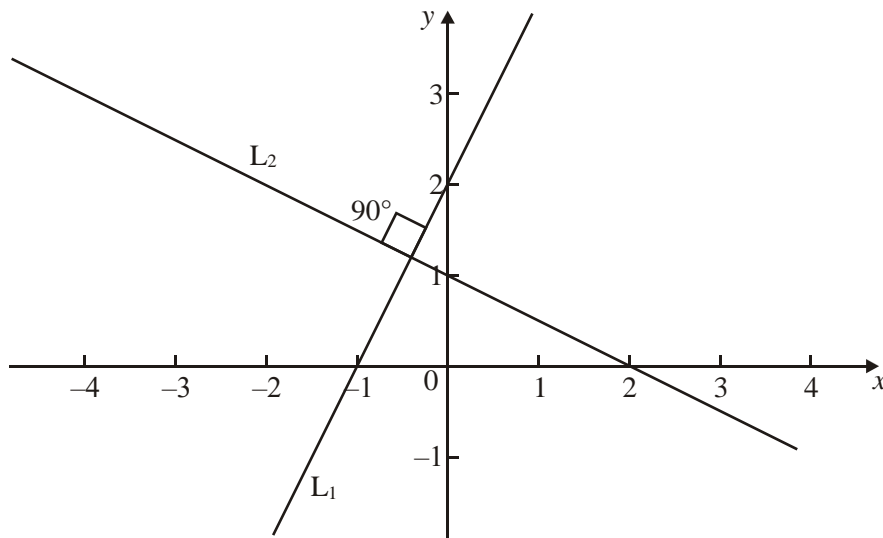

Consider L_1 with equation $y = 2x + 2$ and L_2 with equation $y = -\dfrac{1}{4}x + 1$.

(a) Write down the gradients of L_1 and L_2 **using the given equations**.

(b) Which of the two lines has the student drawn incorrectly?

(c) How can you tell from the answer to part (a) that the angle between L_1 and L_2 should not be 90°?

(d) Draw the correct version of the incorrectly drawn line on the diagram.

(Total 8 marks)

4. The four diagrams below show the graphs of four different straight lines, all drawn to the same scale. Each diagram is numbered and c is a positive constant.

Number 1

Number 3
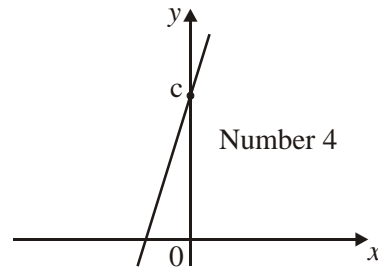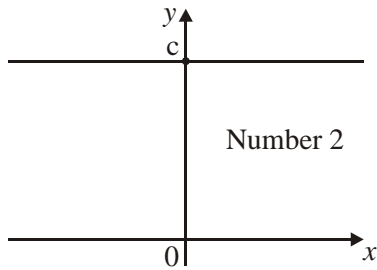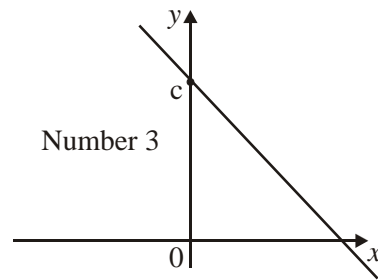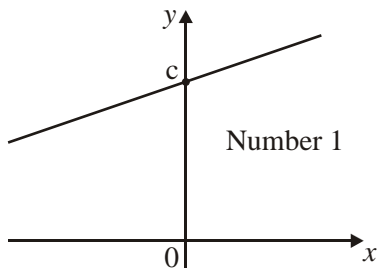
Number 2

Number 4

In the table below, write the number of the diagram whose straight line corresponds to the equation in the table.

Equation	Diagram number
$y = c$	
$y = -x + c$	
$y = 3x + c$	
$y = \dfrac{1}{3}x + c$	

(Total 8 marks)

5. Vanessa wants to rent a place for her wedding reception. She obtains two quotations.

(a) The local council will charge her £30 for the use of the community hall plus £10 per guest.

(i) **Copy** and complete this table for charges made by the local council.

Number of guests (N)	10	30	50	70	90
Charges (C) in £					

(2)

(ii) On graph paper, using suitable scales, draw and label a graph showing the charges. Take the horizontal axis as the number of guests and the vertical axis as the charges.

(3)

(iii) Write a formula for C, in terms N, that can be used by the local council to calculate their charges.

(1)

(b) The local hotel calculates charges for their conference room using the formula:

$$C = \frac{5N}{2} + 500$$

where C is the charge in £ and N is the number of guests.

(i) Describe, **in words only**, what this formula means.

(2)

(ii) **Copy** and complete this table for the charges made by the hotel.

Number of guests (N)	0	20	40	80
Charges (C) in £				

(2)

(iii) On the same axes used in part (a)(ii), draw this graph of C. Label your graph clearly.

(2)

(c) Explain, briefly, what the two graphs tell you about the charges made.

(2)

(d) Using your graphs or otherwise, find

(i) the cost of renting the community hall if there are 87 guests;

(2)

(ii) the number of guests if the hotel charges £650;

(2)

(iii) the difference in charges between the council and the hotel if there are 82 guests at the reception.

(2)
(Total 20 marks)