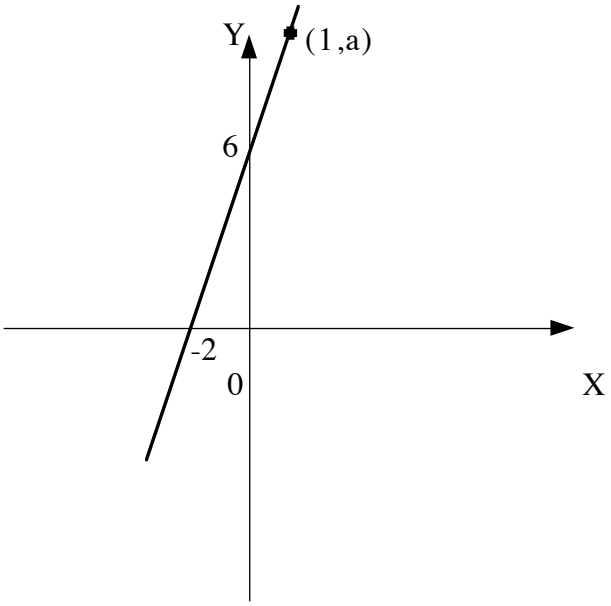
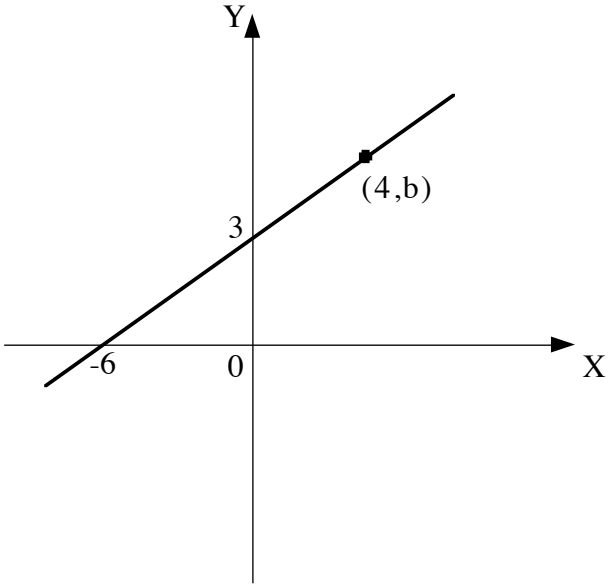
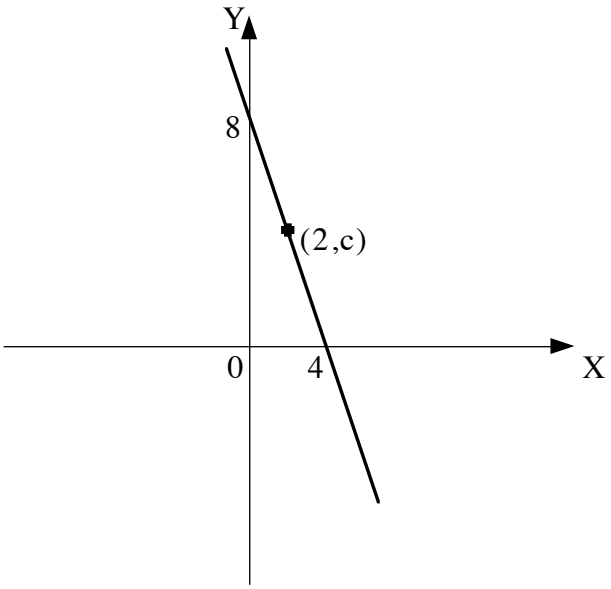
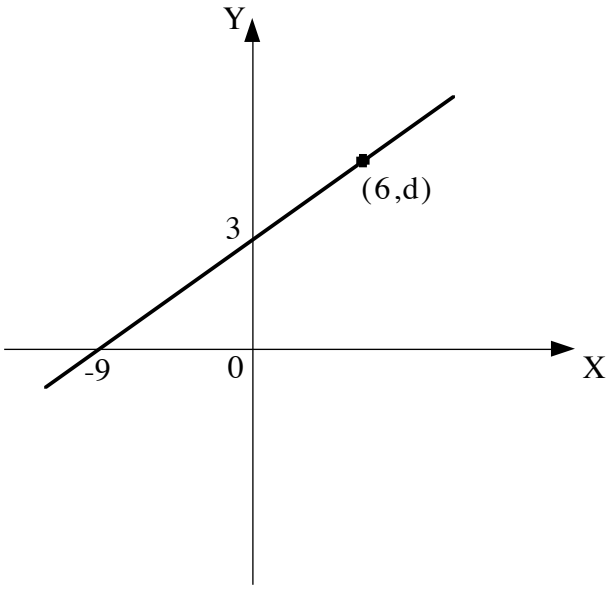
STRAIGHT LINE

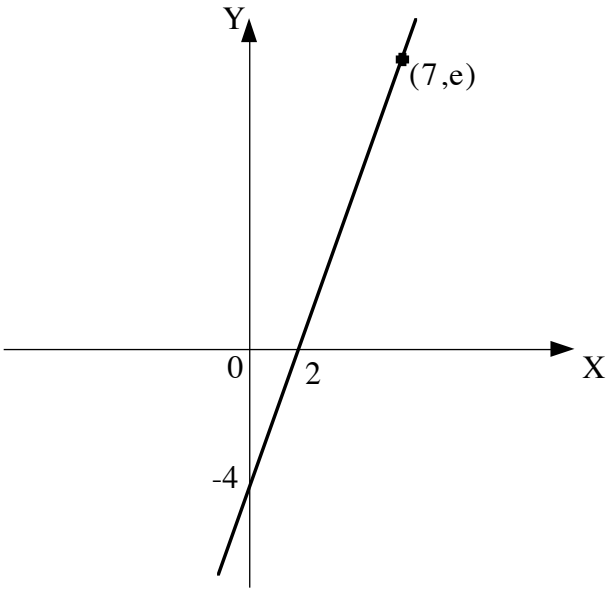
1. In each of the following graphs the points where the line meets the axes are shown. For each graph find the equation of the line and so find the value of a, b, c etc.

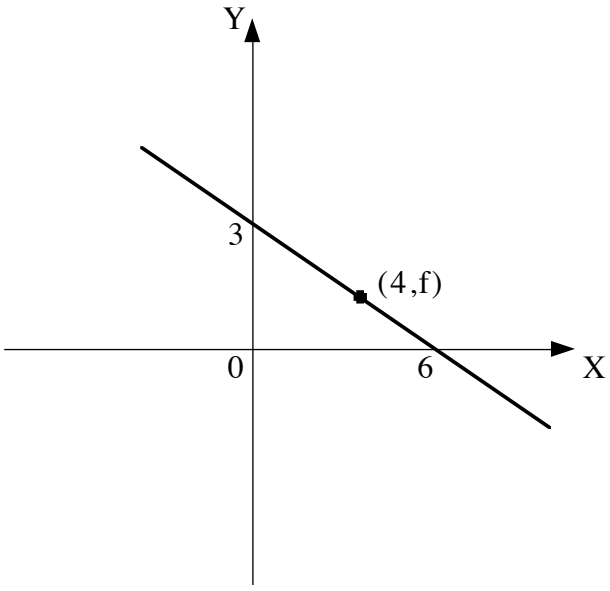


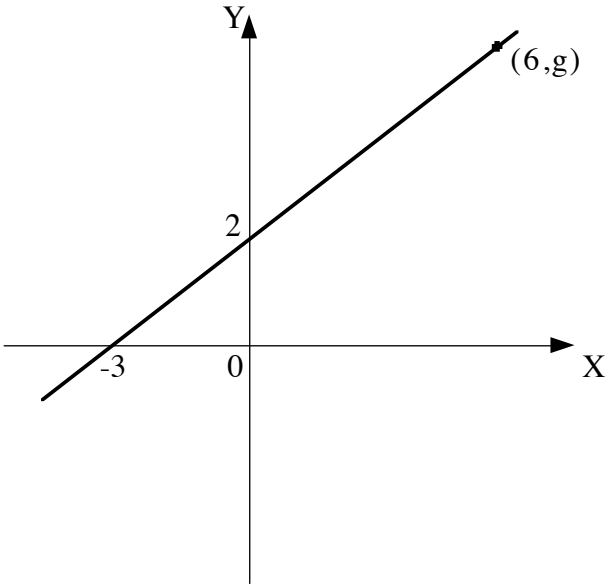


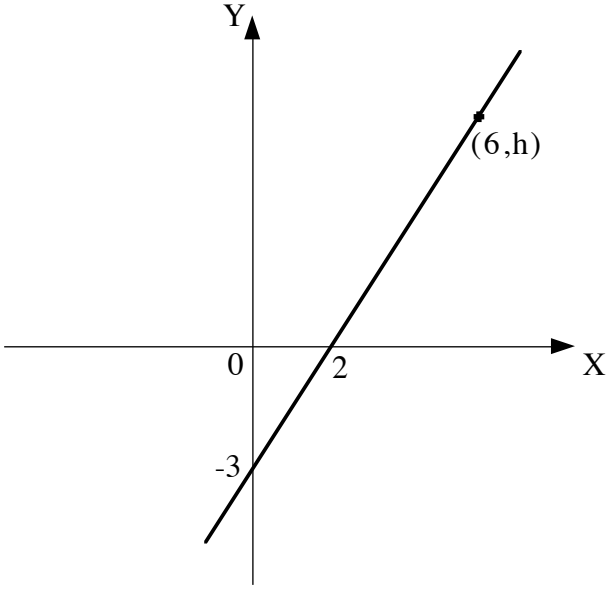


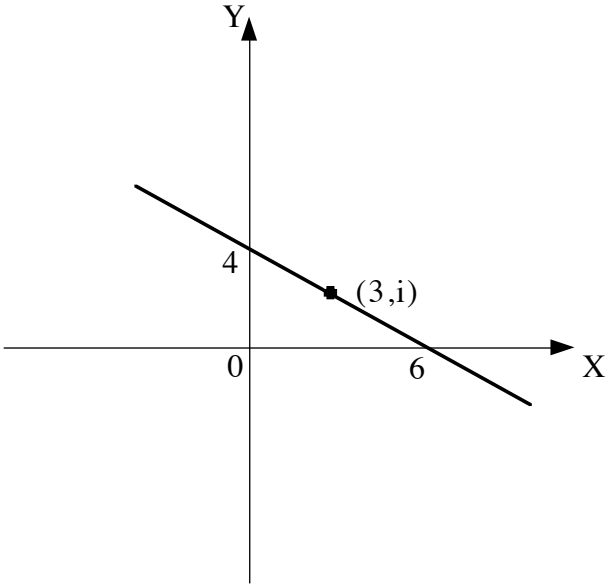


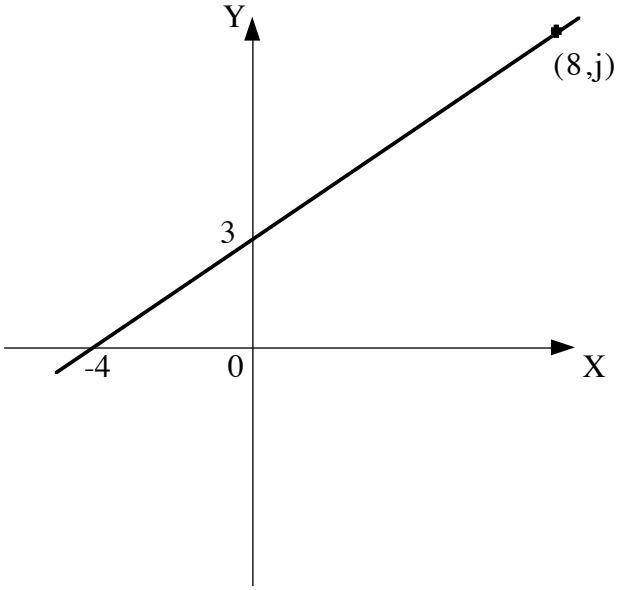


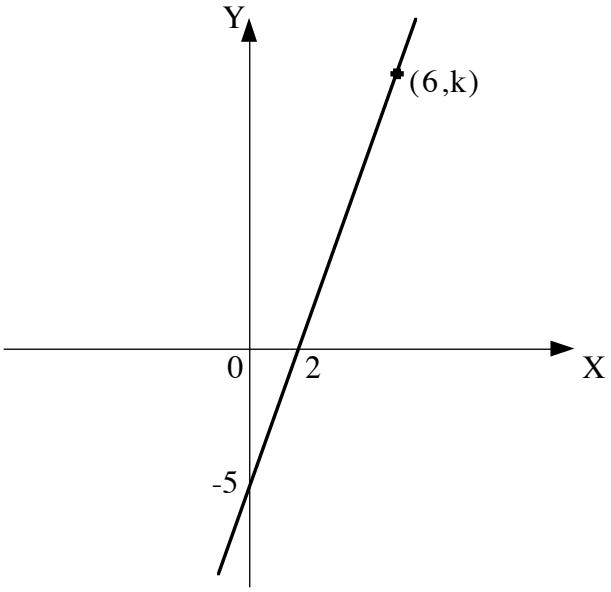


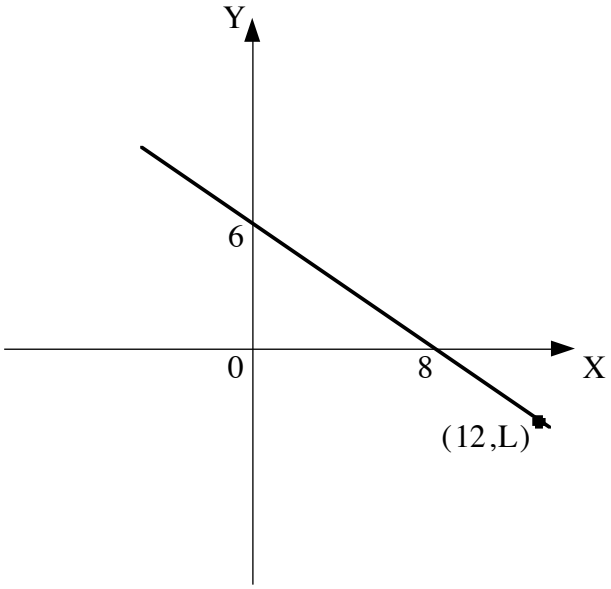

Y
(6,g)
2
-3
0
X


Y
(6,h)
0
2
X
-3

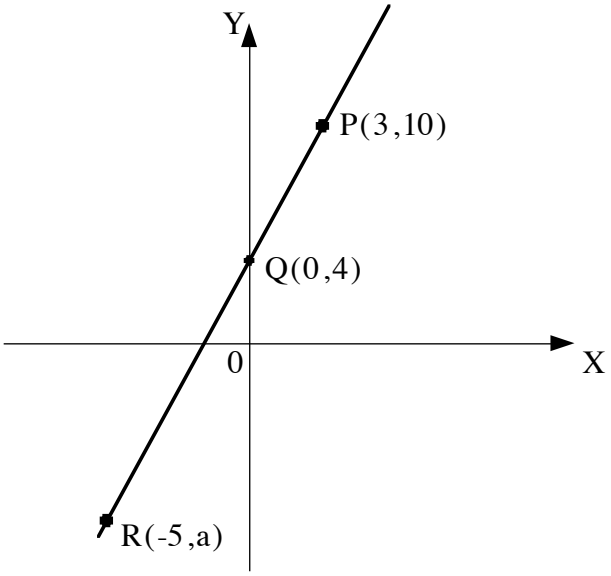

Y
4
(3,i)
0
6
X

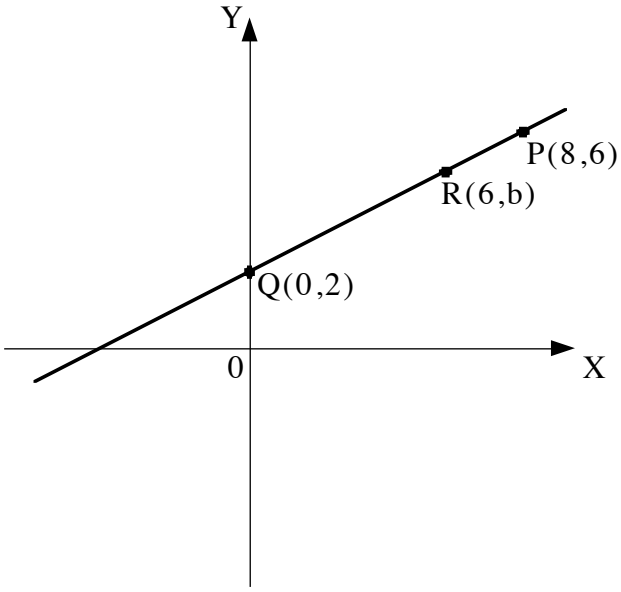

Y
(8,j)
3
-4
0
X

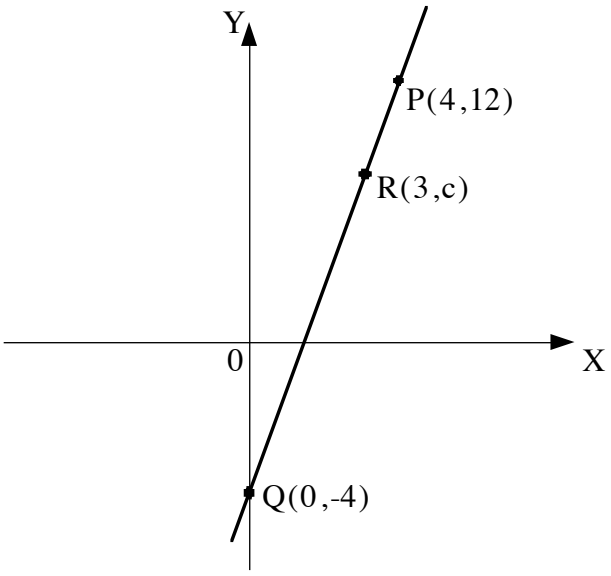

Y
(6,k)
0
2
X
-5

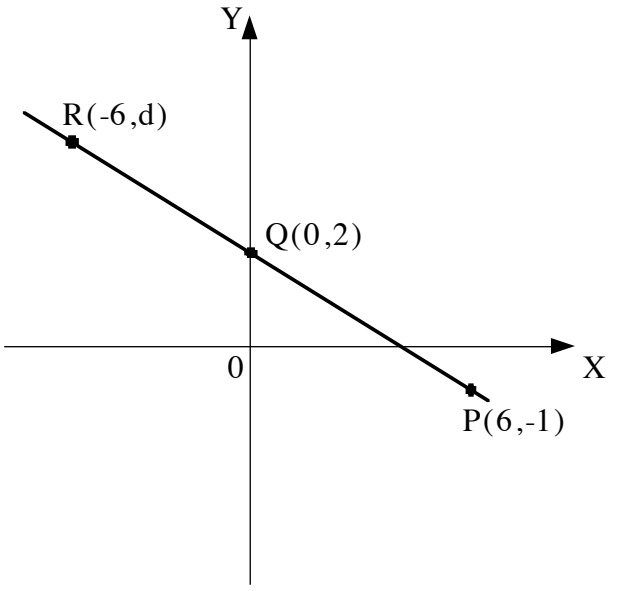

Y
6
0
8
X
(12,L)

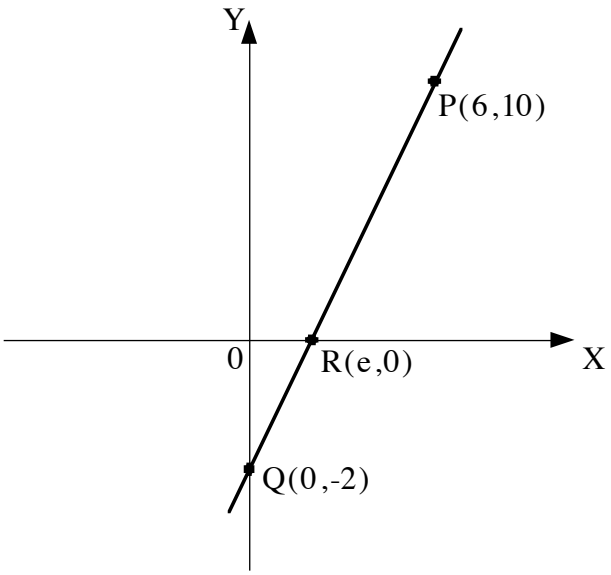
2. In each of the following find the equation of the line passing through the points P and Q. Use the equation to find the value of a, b, c etc.

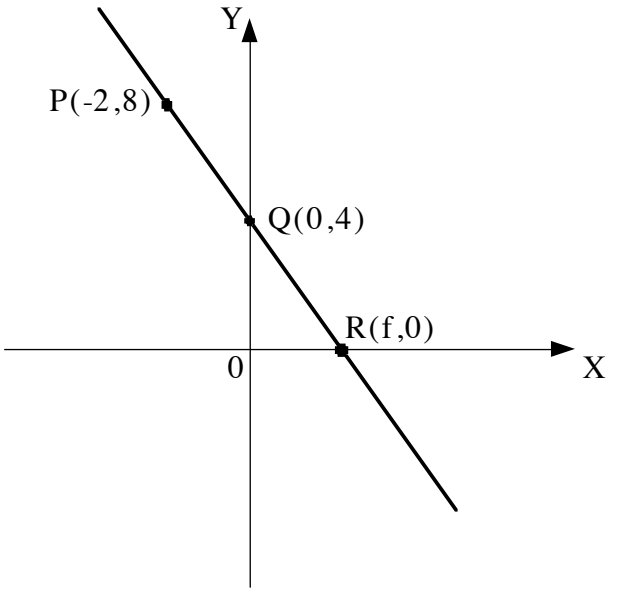


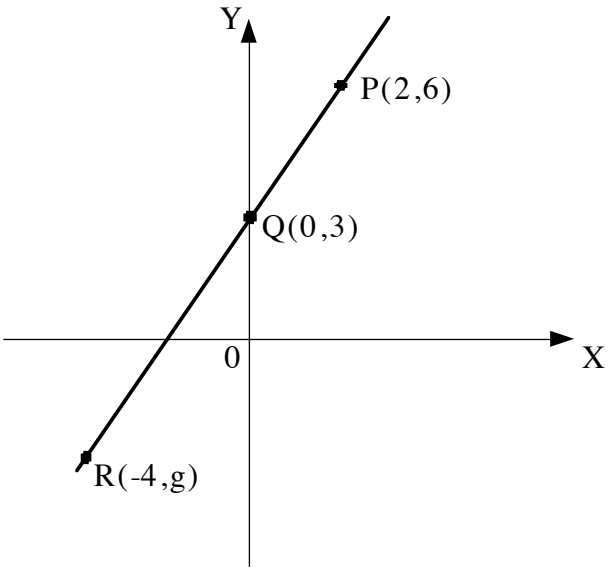


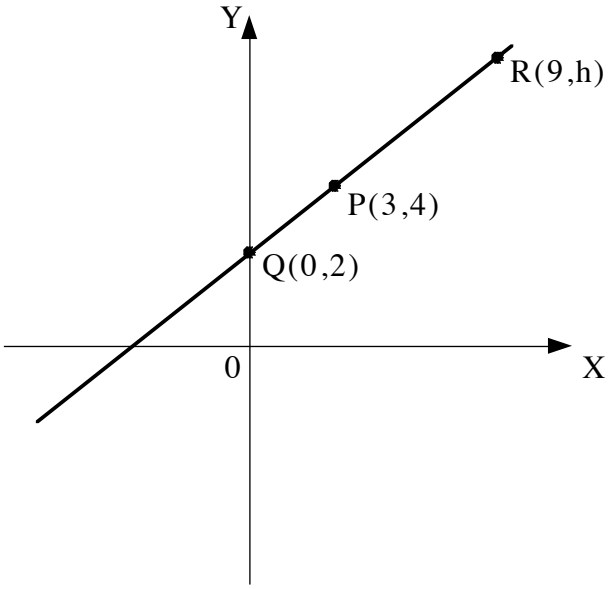


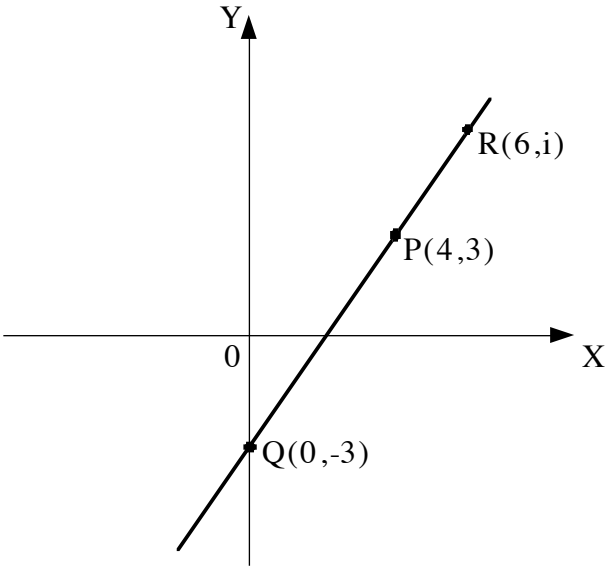


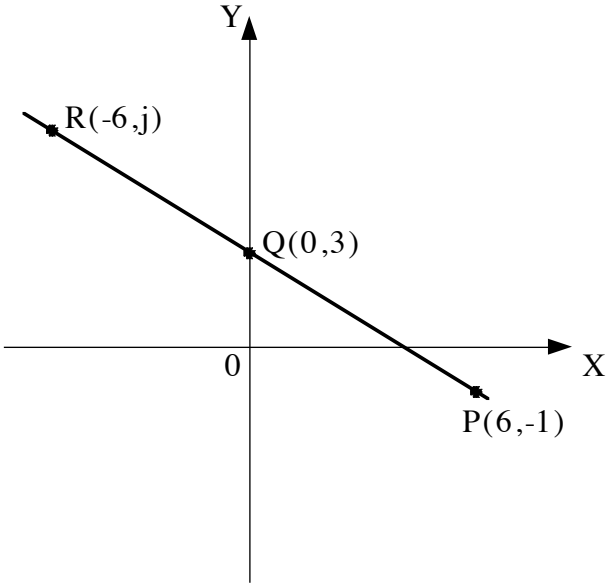


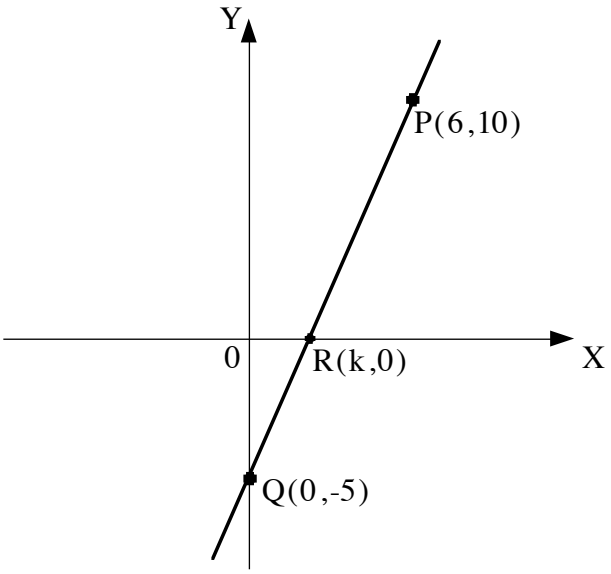


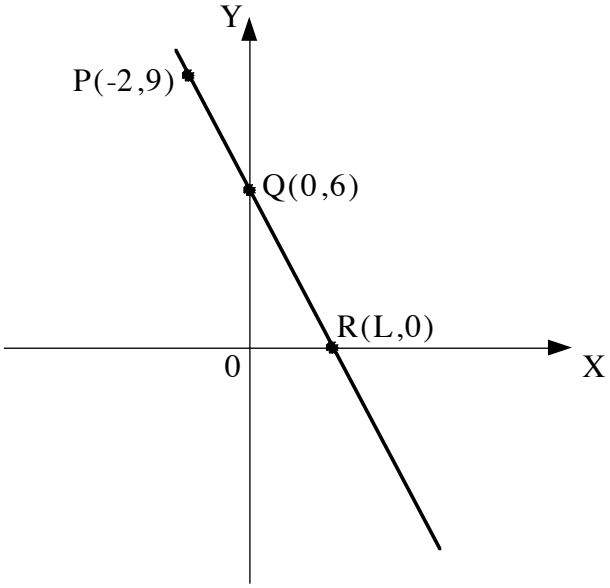

Y
P(2,6)
Q(0,3)
0
X
R(-4,g)


Y
R(9,h)
P(3,4)
Q(0,2)
0
X


Y
R(6,i)
P(4,3)
0
X
Q(0,-3)


Y
R(-6,j)
Q(0,3)
0
X
P(6,-1)


Y
P(6,10)
0
R(k,0)
X
Q(0,-5)


Y
P(-2,9)
Q(0,6)
R(L,0)
0
X

3. A salt is dissolved in a litre of solvent.

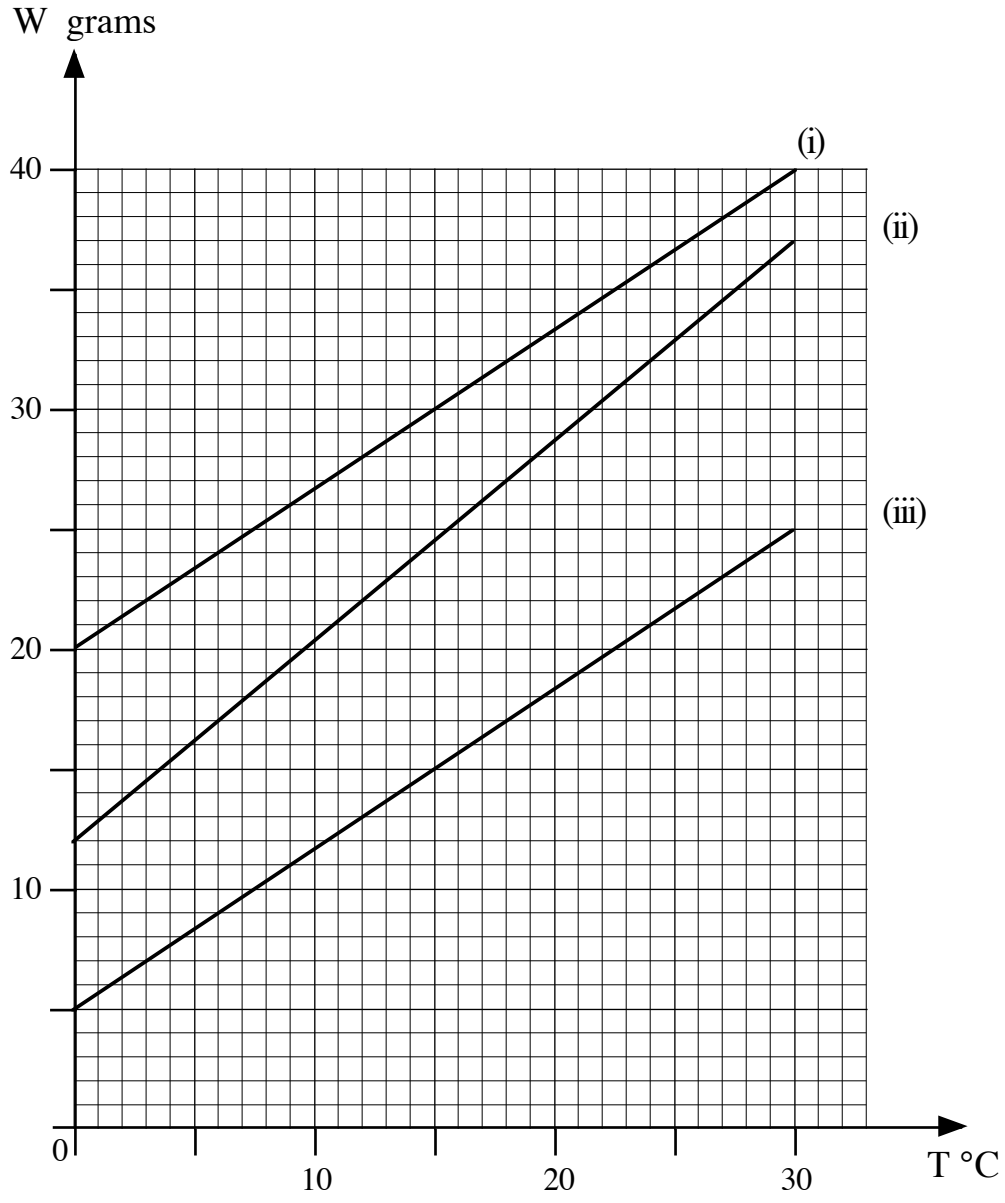
The amount of salt that dissolves is measured at different temperatures and a graph drawn. The graph is a straight line and shows the mass of salt that dissolves at a particular temperature.

This has been done for three salts labelled (i), (ii) and (iii).

(a) The equation of each graph is of the form $W = mT + c$

Find the equation of each of the lines (i), (ii) and (iii).

(b) Use the equations to calculate the mass of each salt (i), (ii) and (iii) that will dissolve at 48 °C.



4. A container is full of water.

   Water is drawn off from the container at a regular rate and the volume remaining recorded at time intervals. A graph is then drawn using the results.

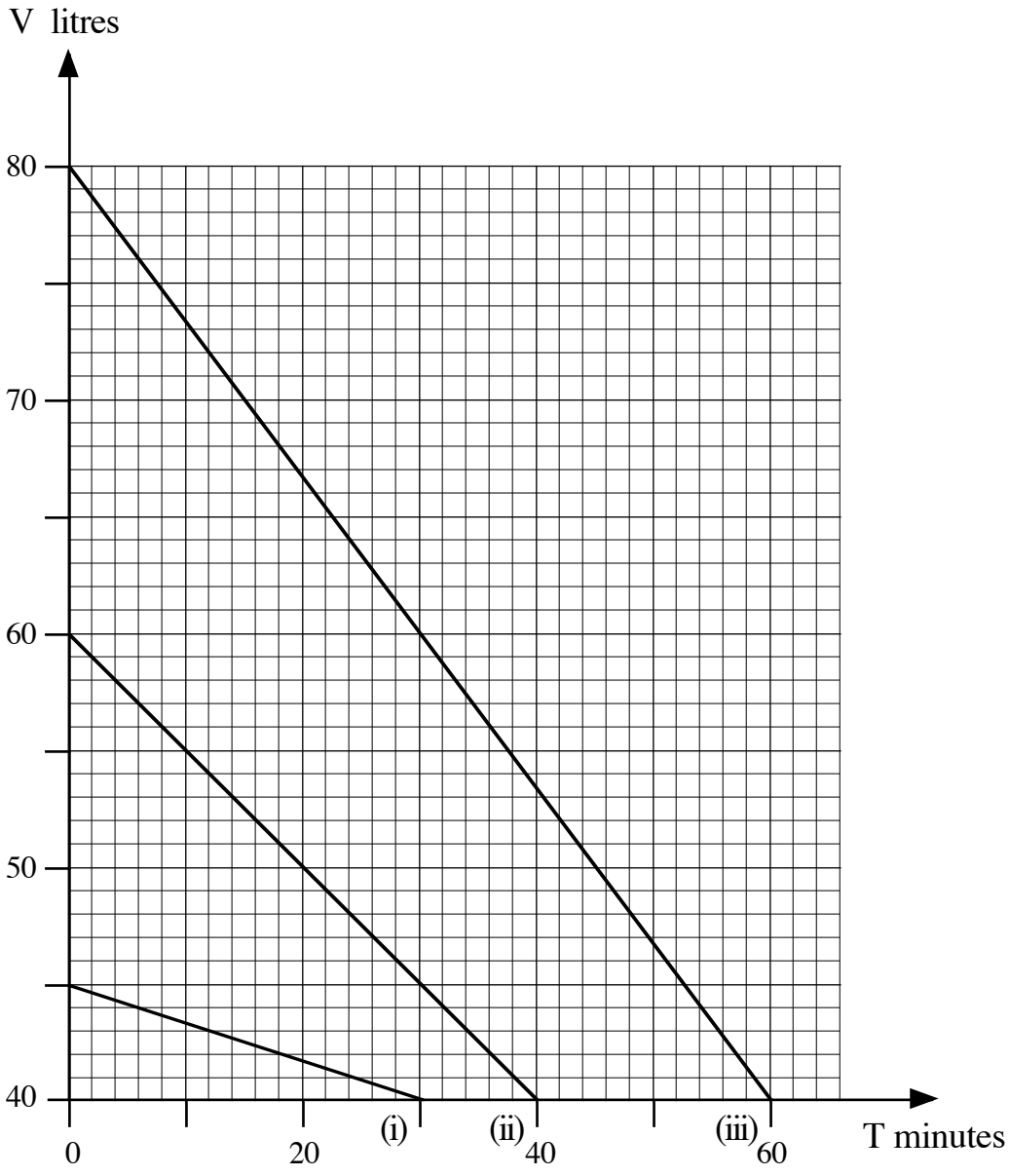
   The graph is a straight line and shows the volume of water remaining after a particular time.

   This has been done for three containers labelled (i), (ii) and (iii).

(a) The equation of each graph is of the form $V = mT + c$

   Find the equation of each of the lines (i), (ii) and (iii).

(b) Use the equations to calculate the time it takes for each container (i), (ii) and (iii) to empty.



ANSWERS

1. (a) $y = 3x + 6$ $a = 9$ (b) $y = \frac{1}{2}x + 3$ $b = 5$ (c) $y = -2x + 8$ $c = 4$
   (d) $y = \frac{1}{3}x + 3$ $d = 5$ (e) $y = 2x - 4$ $e = 10$ (f) $y = -\frac{1}{2}x + 3$ $f = 1$
   (g) $y = \frac{2}{3}x + 2$ $g = 6$ (h) $y = \frac{3}{2}x - 3$ $h = 6$ (i) $y = -\frac{2}{3}x + 4$ $i = 2$
   (j) $y = \frac{3}{4}x + 3$ $j = 9$ (k) $y = \frac{5}{2}x - 5$ $k = 10$ (l) $y = -\frac{3}{4}x + 6$ $L = -3$

2. (a) $y = 2x + 4$ $a = -6$ (b) $y = \frac{1}{2}x + 2$ $b = 5$ (c) $y = 4x - 4$ $c = 8$
   (d) $y = -\frac{1}{2}x + 2$ $d = 5$ (e) $y = 2x - 2$ $e = 1$ (f) $y = -2x + 4$ $f = 2$
   (g) $y = \frac{3}{2}x + 3$ $g = -3$ (h) $y = \frac{2}{3}x + 2$ $h = 8$ (i) $y = \frac{3}{2}x - 3$ $i = 6$
   (j) $y = -\frac{2}{3}x + 3$ $j = 7$ (k) $y = \frac{5}{2}x - 5$ $k = 2$ (l) $y = -\frac{3}{2}x + 6$ $L = 4$

3. (a) (i) $W = \frac{2}{3}T + 20$ (ii) $W = \frac{5}{6}T + 12$ (iii) $W = \frac{2}{3}T + 5$
   (b) (i) 52 grams (ii) 52 grams (iii) 37 grams

4. (a) (i) $V = -\frac{1}{6}T + 45$ (ii) $V = -\frac{1}{2}T + 60$ (iii) $V = -\frac{2}{3}T + 80$
   (b) (i) 270 minutes (ii) 120 minutes (iii) 120 minutes