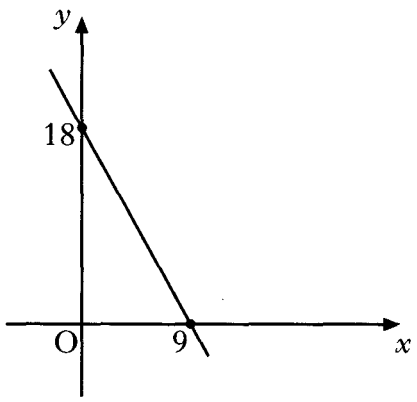
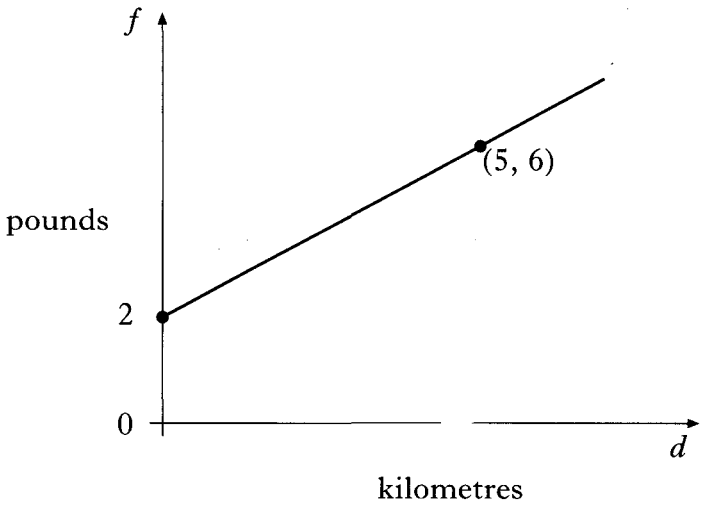
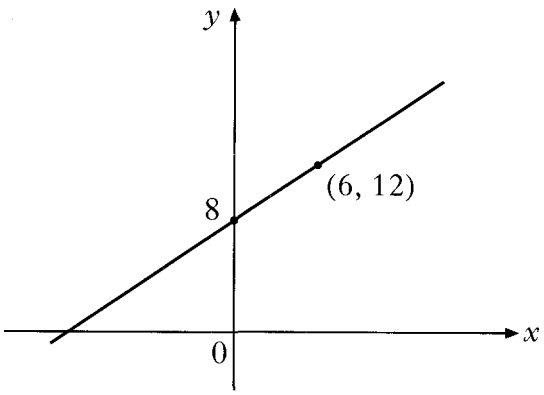
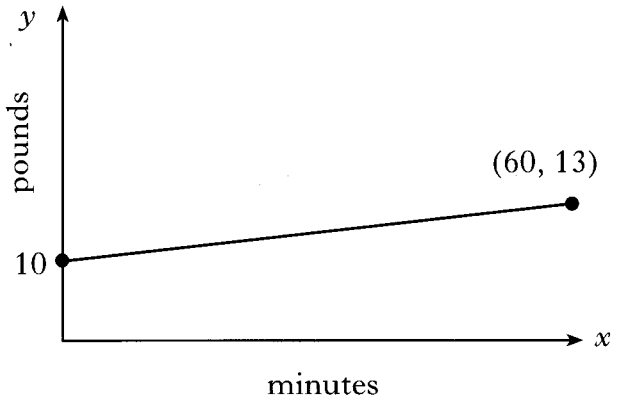
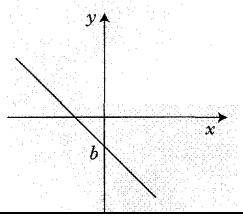
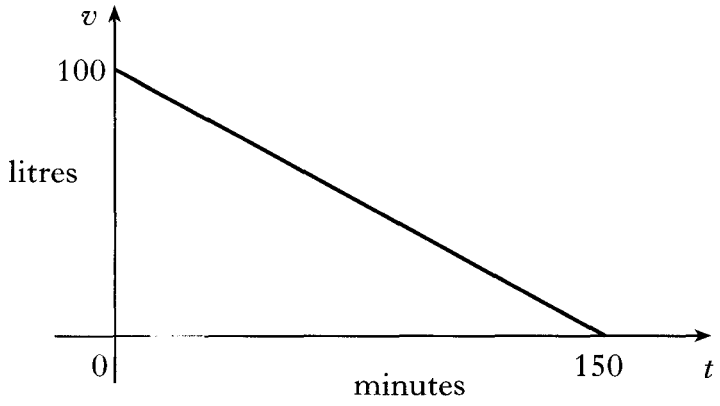
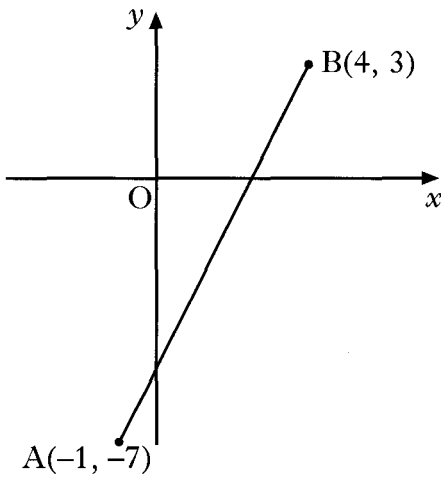
Straight Line

2008 P1	**4.** A straight line cuts the x-axis at the point (9, 0) and the y-axis at the point (0, 18) as shown.  Find the equation of this line.	3	
Ans	$y = -2x + 18$		
2007 P1	**6.** A taxi fare consists of a £2 "call-out" charge **plus** a fixed amount per kilometre. The graph shows the fare, f pounds for a journey of d kilometres.  The taxi fare for a 5 kilometre journey is £6. Find the equation of the straight line in terms of d and f.	4	
Ans	$f = \frac{4}{5}d + 2$		

2006 P1	**4.**  Find the equation of the given straight line.	3	
Ans	$y = \frac{2}{3}x + 8$		
2005 P1	**5.** In an experiment involving two variables, the following values for x and y were recorded. <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>6</td><td>4</td><td>2</td><td>0</td><td>−2</td></tr></table> The results were plotted, and a straight line was drawn through the points. Find the gradient of the line **and** write down its equation.	3	
Ans	*Gradient = -2 , y =-2x + 6*		

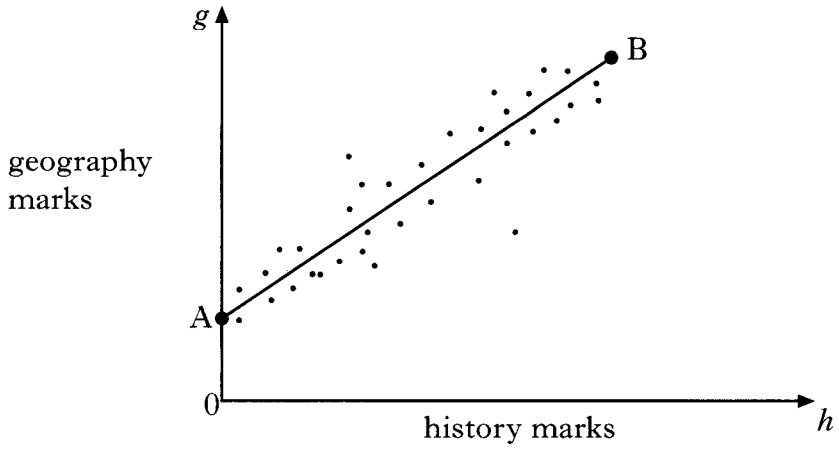
2005 P2	**9.** The monthly bill for a mobile phone is made up of a fixed rental plus call charges. Call charges vary as the time used. The relationship between the monthly bill, y (pounds), and the time used, x (minutes) is represented in the graph below.  (*a*) Write down the fixed rental. (*b*) Find the call charge per minute.		1 3
Ans	(a) £10 (b) 5 pence		
2004 P1	**10.** Two variables x and y are connected by the relationship $y = ax + b$. Sketch a possible graph of y against x to illustrate this relationship when a and b are each less than zero.		3
Ans	 		

2004 P2	**2.** A tank which holds 100 litres of water has a leak. After 150 minutes, there is no water left in the tank.  The above graph represents the volume of water (v litres) against time (t minutes). (a) Find the equation of the line in terms of v and t. (b) How many minutes does it take for the container to lose 30 litres of water?	3	3
Ans	(a) $v = -\frac{2}{3}t + 100$ (b) 45 minutes		

2003 P1	**6.** In the diagram below, A is the point (–1, –7) and B is the point (4, 3).  (*a*) Find the gradient of the line AB. (*b*) AB cuts the *y*-axis at the point (0, –5). Write down the equation of the line AB. (*c*) The point (3*k*, *k*) lies on AB. Find the value of *k*.	1 1	2
Ans	(*a*) 2 (*b*) $y = 2x - 5$ (*c*) $k = 1$		

2002 P1

12. The graph below shows the relationship between the history and geography marks of a class of students.



A best-fitting straight line, AB has been drawn.

Point A represents 0 marks for history and 12 marks for geography.
Point B represents 90 marks for history and 82 marks for geography.

Find the equation of the straight line AB in terms of h and g.

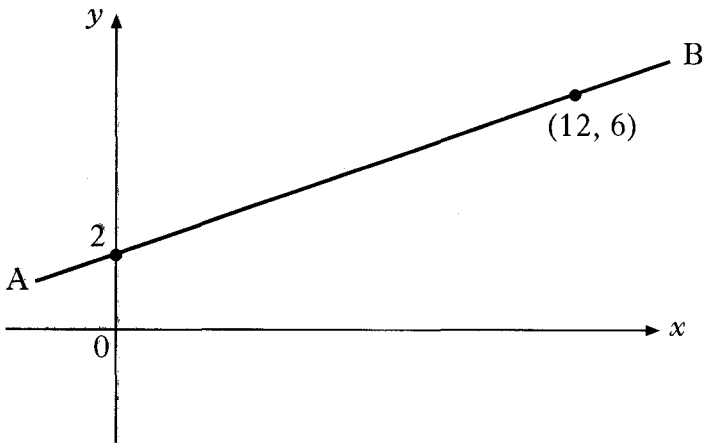
4

Ans $g = \frac{7}{9}h + 12$

2001 P2

4. A water pipe runs between two buildings.

These are represented by the points A and B in the diagram below.



(*a*) Using the information in the diagram, show that the equation of the line AB is $3y - x = 6$. — 3

(*b*) An emergency outlet pipe has to be built across the main pipe. The line representing this outlet pipe has equation $4y + 5x = 46$.

Calculate the coordinates of the point on the diagram at which the outlet pipe will cut across the main water pipe. — 4

Ans

(*a*) gradient $= m = \dfrac{(6-2)}{12-0}$

$= \dfrac{1}{3}$

intercept $= c = 2$

$y = \dfrac{1}{3}x + 2$

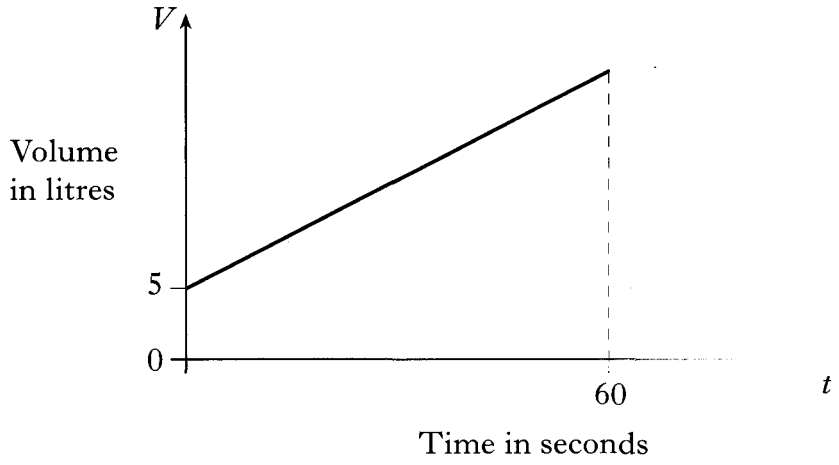
$3y = x + 6$

(*b*) (6,4)

2000 P1

10. The tank of a car contains 5 litres of petrol.

The graph below shows how the volume of petrol in this tank changes as a further 45 litres of petrol is pumped in at a steady rate for 60 seconds.



Find the equation of the straight line in terms of V and t. 4

Ans $V = \frac{3}{4}t + 5$