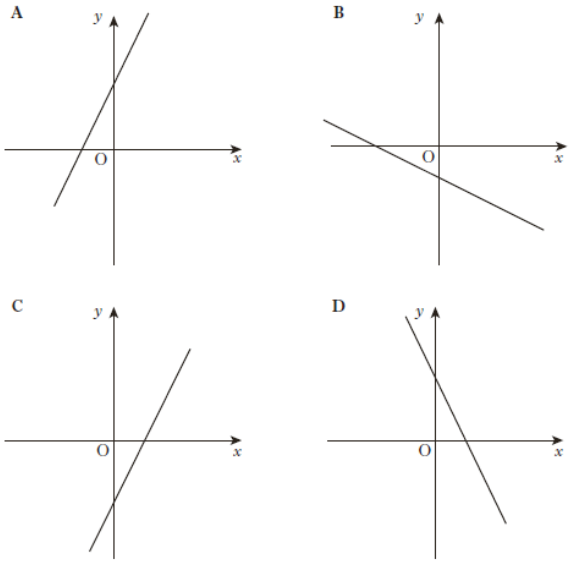
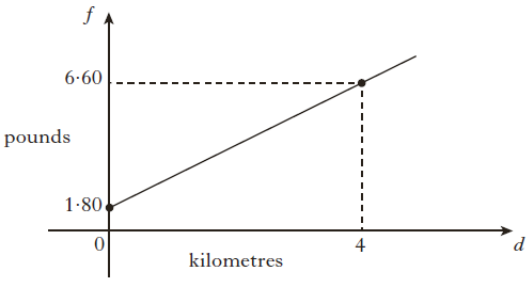
Equation of a Straight Line - Past Paper Questions

1) Four straight line graphs are shown below.



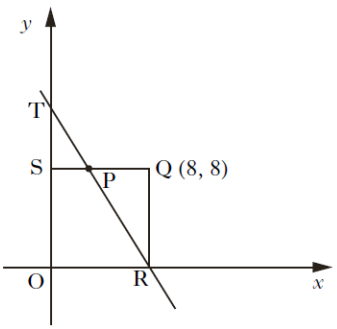
Which one of these above could represent the line with equation $2x + y = 3$?
Give 2 reasons to justify your answer. 3

2) A taxi fare consists of a call-out charge of £1·80 plus a fixed cost per kilometre.
A journey of 4 kilometres costs £6·60.
The straight line graph shows the fare, f pounds, for a journey of d kilometres.



a) Find the equation of the straight line. 3
b) Calculate the fare for a journey of 7 kilometres. 2

3) A square, OSQR, is shown below.
Q is the point (8,8).

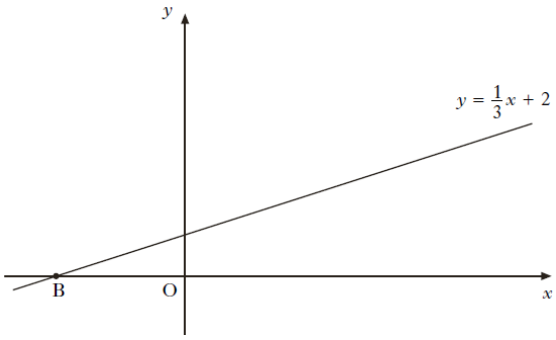


The straight line TR cuts the y-axis at T(0,12) and the x-axis at R.
a) Find the equation of the line TR. 3

The line TR also cuts SQ at P.
b) Find the coordinates of P. 4

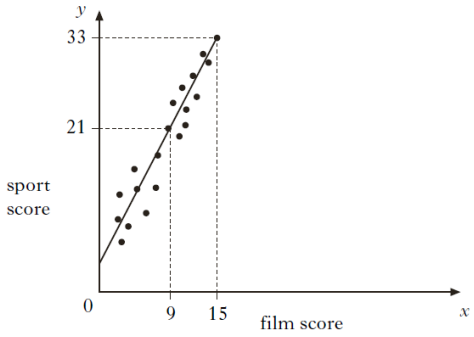
4) Find the equation of the line joining the points (−2, 5) and (3, 15).
Give the equation in its simplest form. 3

5) Part of the graph of the straight line with equation $y = \frac{1}{3}x + 2$, is shown below.



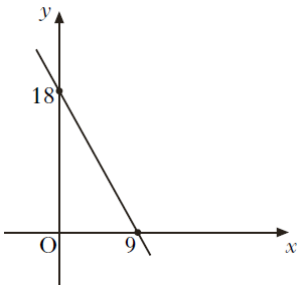
a) Find the coordinates of the point B. 2
b) For what values of x is $y < 0$? 1

6) Teams in a quiz answer questions on film and sport.
This scatter graph shows the scores of some of the teams.

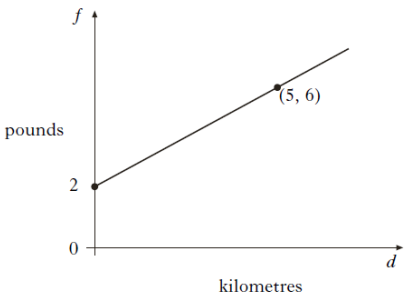


A line of best fit is drawn as shown above.
a) Find the equation of this straight line. 4
b) Use this equation to estimate the sport score for a team with a film score of 20. 2

7) 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

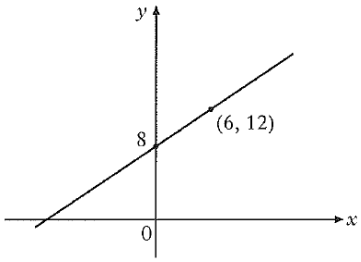


8) A taxi fare consists of a £2 ‘call-out’ charge plus a fixed amount per kilometre.
The graph shows the fare, f pounds for a journey of d kilometres.



The taxi fare for a 5 kilometre journey is £6.
Find the equation of the straight line in terms of d and f. 4

9) Find the equation of the straight line. 3



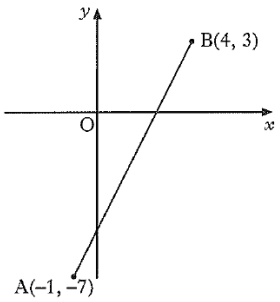
10) In an experiment involving 2 variables, the following values for x and y were recorded.

x	0	1	2	3	4
y	6	4	2	0	-2

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

11) 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

12) In the diagram opposite, A is the point (-1,-7) and B is the point (4,3).

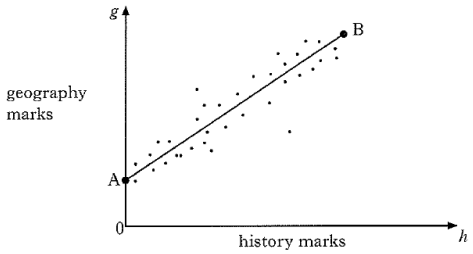


a) Find the gradient of the line AB. 1

b) AB cuts the y-axis at the point (0,-5).
Write down the equation of the line AB. 1

c) The point $(3k,k)$ lies on AB.
Find the value of k. 2

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

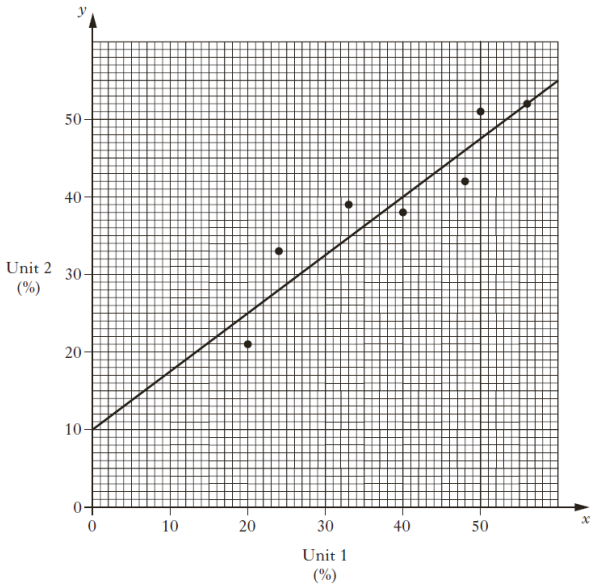


A best-fitting straight line, AB has been drawn.
Point A represents 0 marks for history and 12 marks for geography.
Point B represents 90 marks for history and 82 marks for geography.
Find the equation of the straight line AB in terms of h and g. 4

14) A straight line is represented by the equation $y = mx + c$.
Sketch a possible straight line graph to illustrate this equation when $m < 0$ and $c > 0$. 2

15) A straight line has equation $y = 4x + 5$.
State the gradient of this line. 1

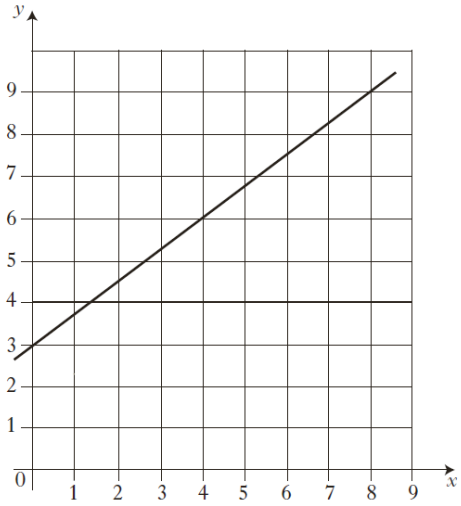
16) The marks of a group of students in the Unit 1 and Unit 2 tests of their Intermediate 2 Mathematics course are shown in the scattergraph below.
A line of best fit has been drawn.



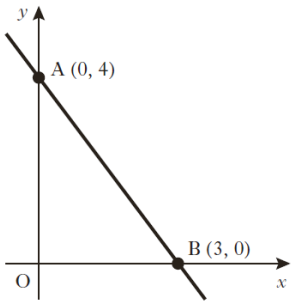
a) Find the equation of this line of best fit. 3

b) Another student scored 80% in the Unit 1 test.
Use your answer to part (a) to predict her mark in the Unit 2 test. 1

17) Find the equation of the straight line shown in the diagram below. 3

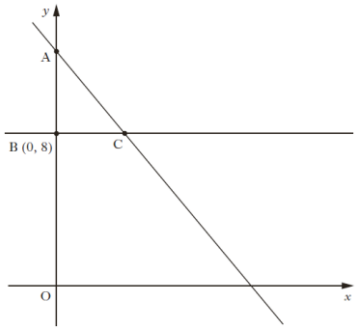


18) Find the equation of the straight line AB. 3



19) A straight line is represented by the equation $y = mx + c$.
Sketch a possible straight line graph to illustrate this equation when $m > 0$ and $c < 0$. 2

20) The straight line with equation $4x + 3y = 36$ cuts the y-axis at A.

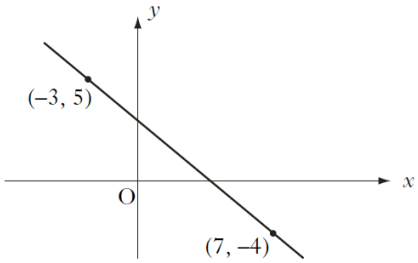


a) Find the coordinates of A. 1

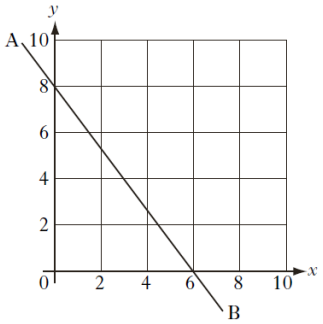
This line meets the line through B (0, 8), parallel to the x-axis, at C as shown above.

b) Find the coordinates of C. 2

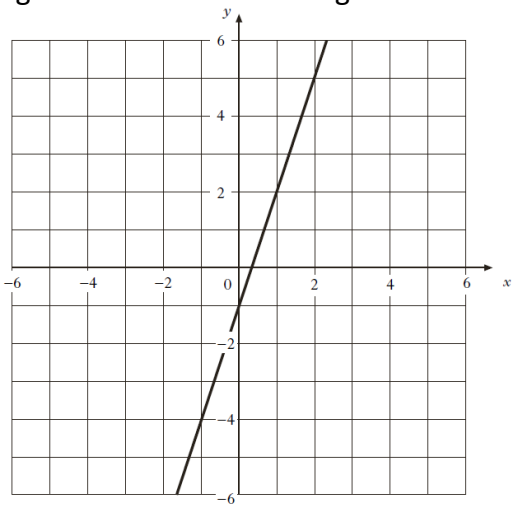
21) Calculate the gradient of the straight line passing through the points (–3, 5) and (7, –4). 1



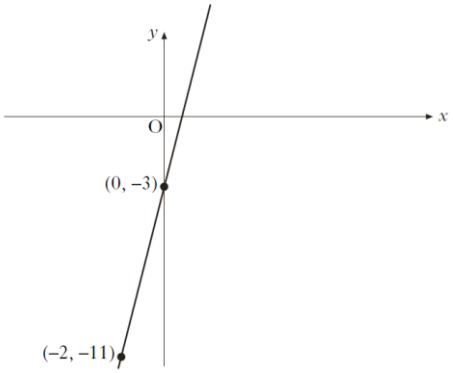
22) Find the equation of the straight line AB shown in the diagram. 3



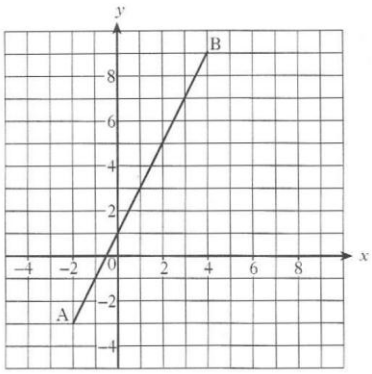
23) Find the equation of the straight line shown in the diagram. 3



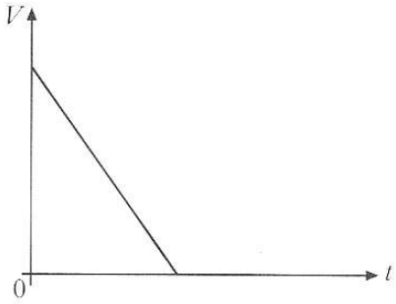
24) Find the equation of the straight line passing through the points (0, –3) and (–2, –11). 3



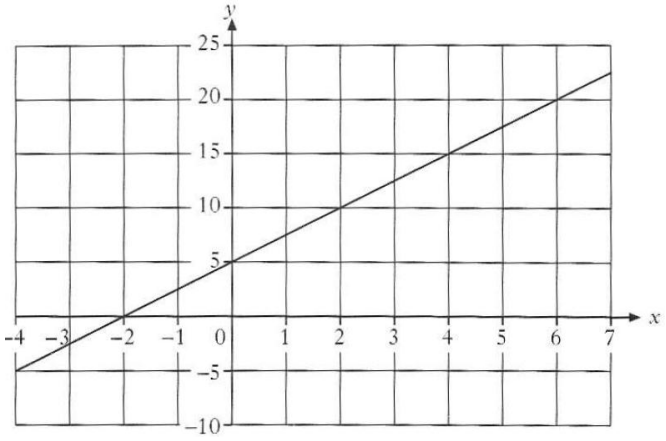
25) Find the equation of the straight line AB. 3



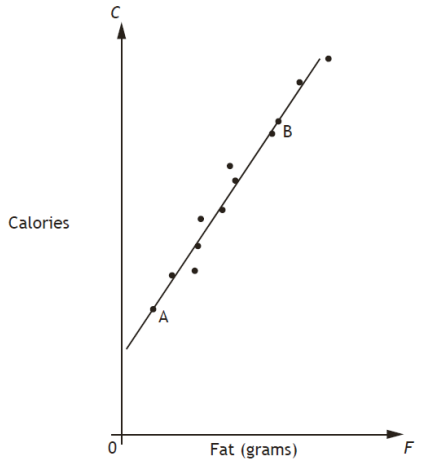
26) A bath contains 150 litres of water.
Water is drained from the bath at a steady rate of 30 litres per minute.
The graph of the volume, V litres, of water in the bath against the time, t minutes, is shown opposite.
Write down an equation connecting V and t. 3



27) Find the equation of the straight line shown in the diagram. 3



28) McGregor's Burgers sells fast food.
The graph shows the relationship between the amount of fat, F grams, and the number of calories, C, in some of their sandwiches.



A line of best fit has been drawn.
Point A represents a sandwich which has 5 grams of fat and 200 calories.
Point B represents a sandwich which has 25 grams of fat and 500 calories.

a) Find the equation of the line of best fit in terms of F and C. 3

b) A Super Deluxe sandwich contains 40 grams of fat.
Use your answer to part (a) to estimate the number of calories this sandwich contains. 1