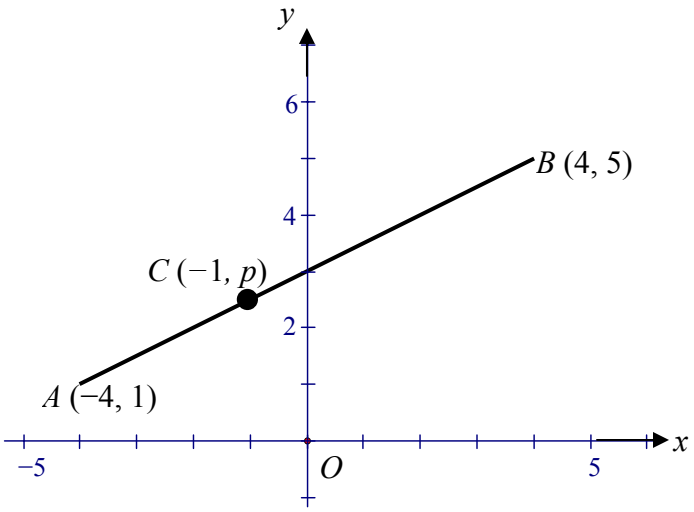
Q1 Solve the simultaneous equations

(a) $8x - y = 27$
$4x - 3y = 1$. **[3]**

(b) $\frac{x}{3} + \frac{y}{4} = 3x - 7y - 37 = 0$. **[4]**

Q2 In the diagram below, the point C lies on the line AB.



(a) Show that $p = 2.5$. **[2]**

(b) Write down the equation of the line OC. **[1]**

Q3 Find the equation of the line that is parallel to the line $x + y = 0$ and passes through the point (3, –4). **[2]**

Q4 **(a)** Without drawing any graphs, explain if the point (3, 1) lies on the line $y = \frac{1}{2}(x - 1)$. **[1]**

(b) Draw the straight line $y = 4(x + 1)$. Indicate the values of the x- and y-intercepts on the axes. **[2]**

(c) Write down the equation of the straight line in Figure 1. **[2]**

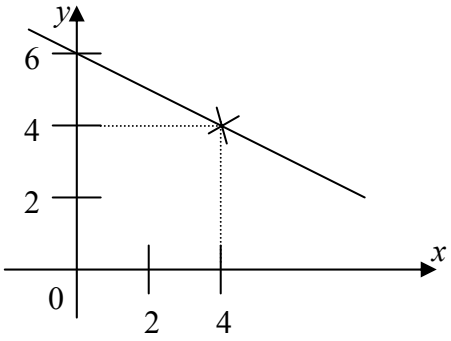


Figure 1

Q5 Given the following simultaneous linear equations

$$y = -x + 6$$

$$y = -x + 4,$$

(a) Explain why these two equations have no solution. **[1]**

(b) How would you change one of the equations to obtain an infinite number of solutions? **[1]**

(c) How would you change one of the equations to obtain one solution?

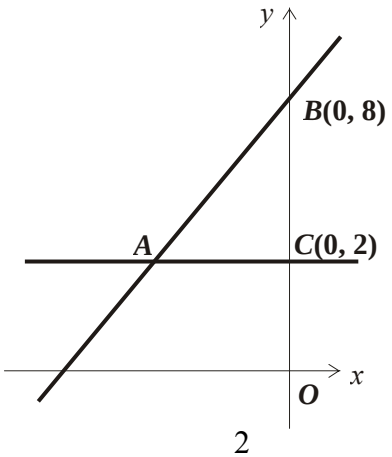
[1]

Q6 If 8 is added to the numerator of a fraction, its value becomes 2.

If 5 is added to the denominator, the fraction becomes $\frac{1}{5}$.

By forming simultaneous equations and solving them, find the fraction. **[5]**

Q7 In the diagram, B is the point (0, 8). The sloping line through B and the horizontal line through C meet at the point A.



(a) Write down the equation of the line AC. **[1]**

(b) Given that the equation of the line AB is $y = 8 + 2x$, find

(i) the coordinates of A, **[1]**

(ii) the area of triangle ABC. **[1]**

Q8 Solve the simultaneous equations using the *graphical* method.

$$-2x + y = -7,$$
$$x + 3y = 14.$$ **[4]**

Q9 Company A charges \$$y$ for x hours of rental its bicycles using the formula

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

(a) Interpret what the above formula means in terms of the hourly charges and initial administrative charge. **[2]**

Company B lease out its bicycles with the following charges

\$$a$ for each hour of rental

\$$b$ for initial administrative charge for each bicycles rental

The table shown below shows the charges for the hours of rental

Number of hour of rental (x)	12	25	c
Total Charge (\$$y$)	31.5	64	74

(b) Use the table and the formula given to form two simultaneous equations to show that $a = 2.5$ and $b = 1.5$. **[4]**

(c) Hence, or otherwise, find the value of c. **[2]**

Bonus

Q10 Find the value of a if the simultaneous equations have no solution.

$ax + (a-1)y = 10$,

$(a-2)x + 3ay = 20$.