

General Algebra

Difficulty: Medium

Question Paper 4

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	General Algebra
Paper	Paper 4
Difficulty	Medium
Booklet	Question Paper 4

Time allowed: 115 minutes

Score: /100

Percentage: /100

Grade Boundaries:

CIE IGCSE Maths (0580)

A*	A	B	C	D
>83%	67%	51%	41%	31%

CIE IGCSE Maths (0980)

9	8	7	6	5	4
>95%	87%	80%	69%	58%	46%

Question 1

(a) y is 5 less than the square of the sum of p and q .

Write down a formula for y in terms of p and q .

[2]

(b) The cost of a magazine is $\$x$ and the cost of a newspaper is $\$(x - 3)$.

The total cost of 6 magazines and 9 newspapers is $\$51$.

Write down and solve an equation in x to find the cost of a magazine.

[4]

(c) Bus tickets cost \$3 for an adult and \$2 for a child.

There are a adults and c children on a bus.

The total number of people on the bus is 52.

The total cost of the 52 tickets is \$139.

Find the number of adults and the number of children on the bus.

[5]

Question 2

(a) The cost of a bottle of water is \$ w .

The cost of a bottle of juice is \$ j .

The total cost of 8 bottles of water and 2 bottles of juice is \$12.

The total cost of 12 bottles of water and 18 bottles of juice is \$45.

Find the cost of a bottle of water and the cost of a bottle of juice.

[5]

(b) Roshni cycles 2 kilometres at y km/h and then runs 4 kilometres at $(y - 4)$ km/h.
The whole journey takes 40 **minutes**.

(i) Write an equation in y and show that it simplifies to $y^2 - 13y + 12 = 0$.

[4]

(ii) Factorise $y^2 - 13y + 12$. [2]

(iii) Solve the equation $y^2 - 13y + 12 = 0$. [1]

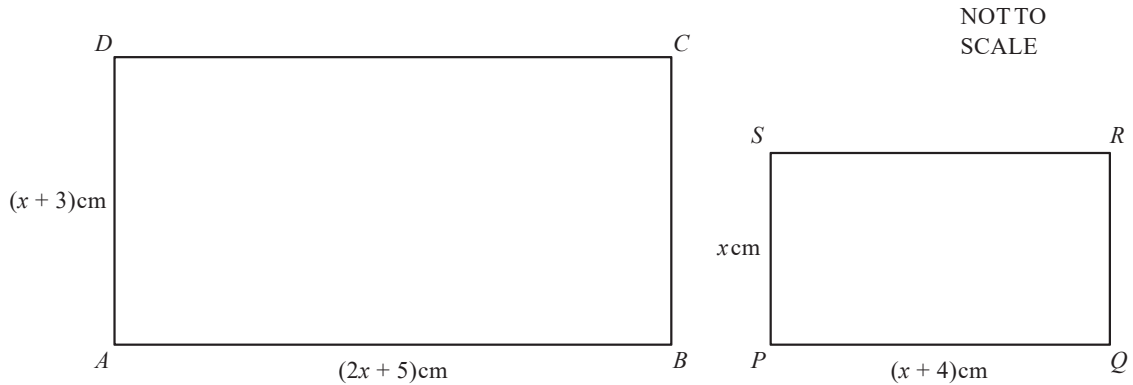
(iv) Work out Roshni's running speed. [1]

(c) Solve the equation

$$u^2 - u - 4 = 0.$$

Show all your working and give your answers correct to 2 decimal places. [4]

Question 3



The diagram shows two rectangles $ABCD$ and $PQRS$.

$AB = (2x + 5)$ cm, $AD = (x + 3)$ cm, $PQ = (x + 4)$ cm and $PS = x$ cm.

- (a) For one value of x , the area of rectangle $ABCD$ is 59 cm^2 more than the area of rectangle $PQRS$.
- (i) Show that $x^2 + 7x - 44 = 0$. [3]
- (ii) Factorise $x^2 + 7x - 44$. [2]
- (iii) Solve the equation $x^2 + 7x - 44 = 0$. [1]
- (iv) Calculate the size of angle DBA . [2]

(b) For a **different** value of x , the rectangles $ABCD$ and $PQRS$ are similar.

(i) Show that this value of x satisfies the equation $x^2 - 2x - 12 = 0$. [3]

(ii) Solve the equation $x^2 - 2x - 12 = 0$, giving your answers correct to 2 decimal places. [4]

(iii) Calculate the perimeter of the rectangle $PQRS$. [1]

Question 4

(a) Solve the equation $\frac{m-3}{4} + \frac{m+4}{3} = -7$. [4]

(b) (i) $y = \frac{3}{x-1} - \frac{2}{x+3}$

Find the value of y when $x = 5$. [1]

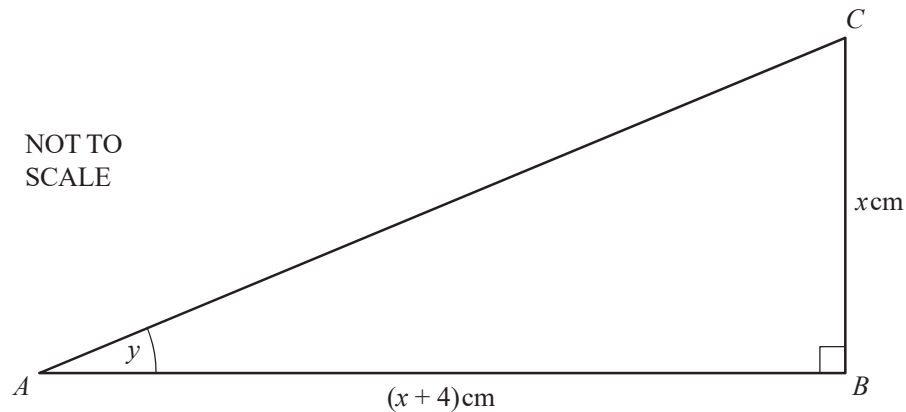
(ii) Write $\frac{3}{x-1} - \frac{2}{x+3}$ as a single fraction. [2]

(iii) Solve the equation $\frac{3}{x-1} - \frac{2}{x+3} = \frac{1}{x}$. [3]

(c) $p = \frac{t}{q-1}$

Find q in terms of p and t . [3]

Question 5



- (a) When the area of triangle ABC is 48 cm^2 ,
- (i) show that $x^2 + 4x - 96 = 0$, [2]
- (ii) solve the equation $x^2 + 4x - 96 = 0$, [2]
- (iii) write down the length of AB . [1]
- (b) When $\tan y = \frac{1}{6}$, find the value of x . [2]
- (c) When the length of AC is 9 cm ,
- (i) show that $2x^2 + 8x - 65 = 0$, [2]
- (ii) solve the equation $2x^2 + 8x - 65 = 0$, [4]
(Show your working and give your answers correct to 2 decimal places.)
- (iii) calculate the perimeter of triangle ABC . [1]

Question 6

(a) (i) Factorise $x^2 - x - 20$. [2]

(ii) Solve the equation $x^2 - x - 20 = 0$. [1]

(b) Solve the equation $3x^2 - 2x - 2 = 0$. [4]
Show all your working and give your answers correct to 2 decimal places.

(c) $y = m^2 - 4n^2$

(i) Factorise $m^2 - 4n^2$. [1]

(ii) Find the value of y when $m = 4.4$ and $n = 2.8$. [1]

(iii) $m = 2x + 3$ and $n = x - 1$.
Find y in terms of x , in its simplest form. [2]

(iv) Make n the subject of the formula $y = m^2 - 4n^2$. [3]

(d) (i) $m^4 - 16n^4$ can be written as $(m^2 - kn^2)(m^2 + kn^2)$.
Write down the value of k . [1]

(ii) Factorise completely $m^4n - 16n^5$. [2]

Question 7

A packet of sweets contains chocolates and toffees.

- (a) There are x chocolates which have a total mass of 105 grams.

Write down, in terms of x , the mean mass of a chocolate. [1]

- (b) There are $x + 4$ toffees which have a total mass of 105 grams.

Write down, in terms of x , the mean mass of a toffee. [1]

- (c) The difference between the two mean masses in **parts (a) and (b)** is 0.8 grams.

Write down an equation in x and show that it simplifies to $x^2 + 4x - 525 = 0$. [4]

- (d) (i) Factorise $x^2 + 4x - 525$. [2]

- (ii) Write down the solutions of $x^2 + 4x - 525 = 0$. [1]

- (e) Write down the total number of sweets in the packet. [1]

- (f) Find the mean mass of a sweet in the packet. [2]