IGCSE · Cambridge (CIE) · Maths

1 hour 14 questions

Calculator Questions

Simultaneous Equations

Linear Simultaneous Equations / Quadratic Simultaneous Equations

Medium (4 questions)	/14
Hard (5 questions)	/27
Very Hard (5 questions)	/31
Total Marks	**/72**

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Medium Questions

1 Solve the simultaneous equations. You must show all your working.

$$\frac{1}{2}x - 3y = 9$$
$$5x + y = 28$$

(3 marks)

2 Solve the simultaneous equations

$$2x + 7y = 17$$
$$5x + 3y = -1$$

Show clear algebraic working.

x = ...

y = ...

(4 marks)

3 Solve the simultaneous equations

$$5a + 2c = 10$$
$$2a - 4c = 7$$

Show clear algebraic working.

a = ...

c = ...

(3 marks)

4 Solve the simultaneous equations

$$7x - 2y = 34$$
$$3x + 5y = -3$$

Show clear algebraic working.

x = ...

y = ...

(4 marks)

Hard Questions

1 Solve the simultaneous equations.
You must show all your working.

$$x = 7 - 3y$$
$$x^2 - y^2 = 39$$

$x =$ ..... $y =$ .....
$x =$ ..... $y =$ .....

(6 marks)

2 Solve the simultaneous equations.
You must show all your working.

$$2x + 3y = -12$$
$$5x + 2y = 14$$

$x =$ .....
$y =$ .....

(4 marks)

3 Solve the simultaneous equations $x^2 + y^2 = 9$

$x + y = 2$

Give your answers correct to 2 decimal places.

(6 marks)

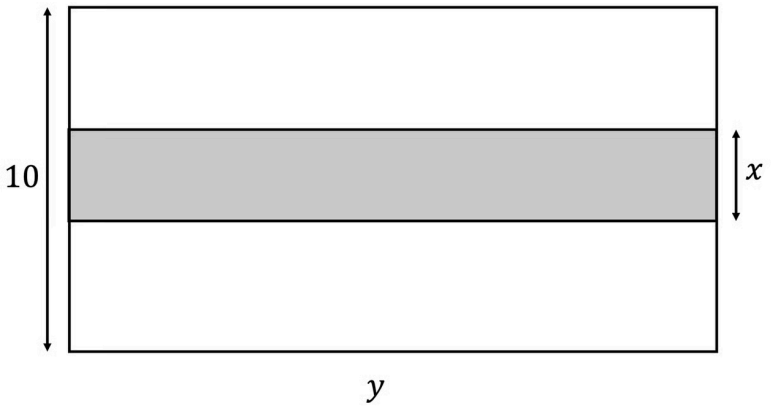
4 Solve the equations

$$x^2 + y^2 = 36$$

$$x = 2y + 6$$

(5 marks)

5



The diagram above represents a courtyard with a length of y metres and a width of 10 metres.

Mark is designing a rectangular path from one side to another, with a width of x metres.

The total area of the courtyard, excluding the path, is $116.30\ \text{m}^2$.

A wall is built around the courtyard, along both longer sides and both shorter sides except where the path cuts through. The total length of the wall is 45.52 metres.

Set up and solve a pair of simultaneous equations to find the value of x and the value of y.

Leave your answers to 2 decimal places.

(6 marks)

Very Hard Questions

1 The straight line $y = 2x + 1$ intersects the curve $y = x^2 + 3x - 4$ at the points *A* and *B*.

Find the coordinates of *A* and *B*.
Give your answers correct to 2 decimal places.

A (..... , ...)
B (..... , ...)

(6 marks)

2 The straight line $y = 3x + 2$ intersects the curve $y = 2x^2 + 7x - 11$ at two points.
Find the coordinates of these two points.
Give your answers correct to 2 decimal places.

(..... , ...)

(..... , ...)

(6 marks)

3 The graphs of $y = (x-1)^2$ and $y = \frac{1}{2}x + 1$ intersect at *A* and *B*. Find the length of *AB*.

AB = ...

(7 marks)

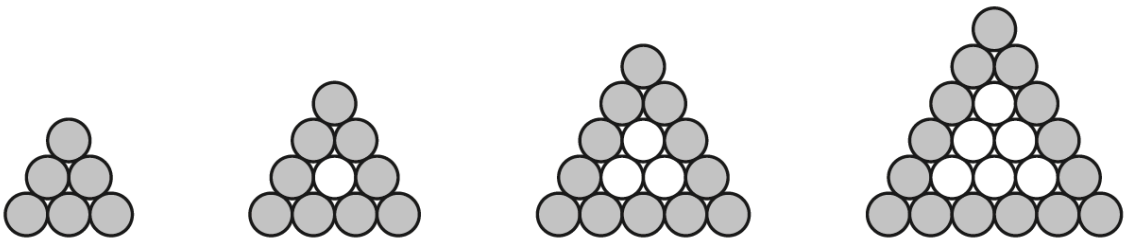
4 Solve the simultaneous equations.
You must show all your working.

$$y = 4 - x$$
$$x^2 + 2y^2 = 67$$

x = ... , y = ...
x = ... , y = ...

(6 marks)

5 Marco is making patterns with grey and white circular mats.



Pattern 1 Pattern 2 Pattern 3 Pattern 4

The patterns form a sequence. Marco makes a table to show some information about the patterns.

Pattern number	1	2	3	4
Number of grey mats	6	9	12	15
Total number of mats	6	10	15	21

Marco needs a total of 6 mats to make the first pattern.
He needs a total of 16 mats to make the first two patterns.
He needs a total of $\frac{1}{6}n^3 + an^2 + bn$ mats to make the first n patterns.

Find the value of a and the value of b.

$a =$ .....
$b =$ .....

(6 marks)