Write your name here

Surname	Other names

In the style of:

Edexcel GCSE

Centre Number	Candidate Number

Mathematics A

Simultaneous Equations

Higher Tier

Past Paper Style Questions
Arranged by Topic

Paper Reference
1MA0/1H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**

Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

1. Solve the simultaneous equations

$3x+2y=7$ ... (1)

$2x-3y=-4$ ... (2)

(1) × 2: $6x + 4y = 14$ ... (3)

(2) × 3: $6x - 9y = -12$ ... (4)

(3) − (4):

$4y - (-9y) = 14 - (-12)$

$\Rightarrow 13y = 26$

$\Rightarrow y = \frac{26}{13} = 2$

In (1):

$3x + 2(2) = 7$

$\Rightarrow x = \frac{7-4}{3} = 1$

$x =$ 1

$y =$ 2

(Total 4 marks)

2. Solve the simultaneous equations

$6x + 2y = -3$ . . . ①
$4x - 3y = 11$ . . . ②

① × 3: $18x + 6y = -9$ . . . ③

② × 2: $8x - 6y = 22$ . . . ④

③ + ④: $26x = 13$

$\Rightarrow x = \frac{13}{26} = \frac{1}{2}$

In ①:

$6\left(\frac{1}{2}\right) + 2y = -3$

$\Rightarrow y = \frac{-3-3}{2} = -\frac{6}{2} = -3$

$x =$ $\frac{1}{2}$, $y =$ -3

(Total 4 marks)

3. Solve the simultaneous equations

$x^2 + y^2 = 5$ ... ①

$y = 3x + 1$ ... ②

Substituting $y = 3x + 1$ from ② into ① gives:

$$x^2 + (3x+1)^2 = 5$$

$$\Rightarrow x^2 + 9x^2 + 6x + 1 - 5 = 0$$

$$\Rightarrow 10x^2 + 6x - 4 = 0$$

$$\Rightarrow (5x - 2)(2x + 2) = 0$$

$$\Rightarrow x = \frac{0+2}{5} = \frac{2}{5} \quad \text{or} \quad x = \frac{0-2}{2} = -1$$

In ②, when $x = \frac{2}{5}$, $y = 3\left(\frac{2}{5}\right) + 1 = \frac{6}{5} + 1$

$= \frac{11}{5}$ or $2\frac{1}{5}$

and when $x = -1$, $y = 3(-1) + 1 = -2$

$x = \frac{2}{5}$ $y = 2\frac{1}{5}$

or $x = -1$ $y = -2$

(Total 6 marks)

4. Solve the simultaneous equations

$4x + y = -1$ .... ①
$4x - 3y = 7$ .... ②

① - ②:

$4y = -8$

$\Rightarrow y = \frac{-8}{4} = -2$

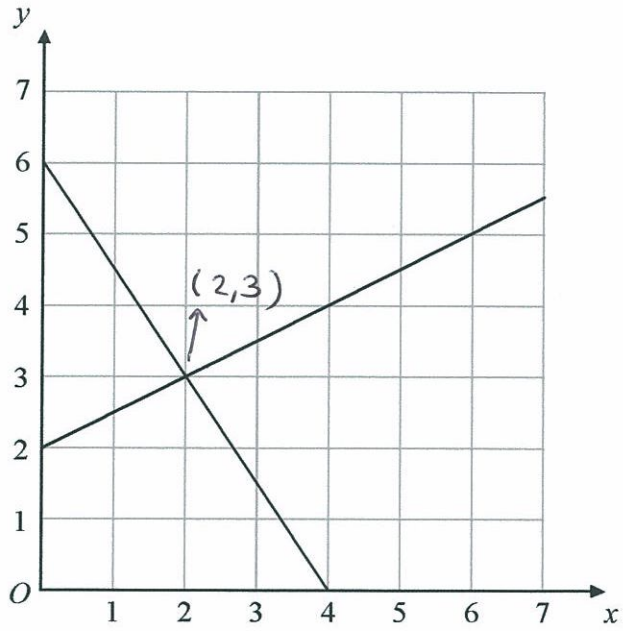
In ①, $4x - 2 = -1$

$\Rightarrow x = \frac{-1+2}{4} = \frac{1}{4}$ or 0.25

$x =$ $\frac{1}{4}$ $y =$ -2

(Total 3 marks)

5.



The diagram shows graphs of $y = \frac{1}{2}x + 2$

and $2y + 3x = 12$

(a) Use the diagram to solve the simultaneous equations

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

$$2y + 3x = 12$$

$x =$ 2 $y =$ 3

(1)

(b) Find an equation of the straight line which is parallel to the line $y = \frac{1}{2}x + 2$ and passes through the point (0, 4).

$y = \frac{1}{2}x + c$ passing through $(0, 4)$

$\Rightarrow 4 = \frac{1}{2}(0) + c$

$\Rightarrow c = 4$

$\therefore y = \frac{1}{2}x + 4$

$y = \frac{1}{2}x + 4$

(2)

(Total 3 marks)

6. Solve the simultaneous equations

$$6x + 2y = -3 \quad \cdots \quad (1)$$
$$4x - 3y = 11 \quad \cdots \quad (2)$$

(1) × 3: $18x + 6y = -9 \cdots (3)$

(2) × 2: $8x - 6y = 22 \cdots (4)$

(3) + (4): $26x = 13$

$\Rightarrow x = \frac{13}{26} = \frac{1}{2}$

In (1), $6\left(\frac{1}{2}\right) + 2y = -3$

$\Rightarrow y = \frac{-3-3}{2} = \frac{-6}{2} = -3$

$x = \frac{1}{2}$, $y = -3$

(Total 4 marks)

7. Solve the simultaneous equations

$$4x + y = 10 \quad \ldots \quad (1)$$
$$2x - 3y = 19 \quad \ldots \quad (2)$$

(2) × 2: $4x - 6y = 38 \ldots (3)$

(1) − (3): $7y = 10 - 38$

$\Rightarrow y = \frac{-28}{7} = -4$

In (1), $4x - 4 = 10$

$\Rightarrow x = \frac{10+4}{4} = \frac{14}{4} = \frac{7}{2} = 3.5$

$x =$ 3.5

$y =$ −4

(Total 3 marks)