

Write your name here

Surname

Other names

In the style of:

Edexcel GCSE

Centre Number

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Candidate Number

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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

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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

$$3x + 2y = 7 \quad \dots \dots \textcircled{1}$$

$$2x - 3y = -4 \quad \dots \dots \textcircled{2}$$

$$\textcircled{1} \times 2: \quad 6x + 4y = 14 \dots \textcircled{3}$$

$$\textcircled{2} \times 3: \quad 6x - 9y = -12 \dots \textcircled{4}$$

$$\textcircled{3} - \textcircled{4}: \quad$$

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

$$\Rightarrow 13y = 26$$

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

In ①:

$$3x + 2(2) = 7$$

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

$$x = \underline{1}$$

$$y = \underline{2}$$

(Total 4 marks)



2. Solve the simultaneous equations

$$\begin{array}{l} 6x + 2y = -3 \quad \dots \quad \textcircled{1} \\ 4x - 3y = 11 \quad \dots \quad \textcircled{2} \end{array}$$

$$\textcircled{1} \times 3: \quad 18x + 6y = -9 \dots \textcircled{3}$$

$$\textcircled{2} \times 2: \quad 8x - 6y = 22 \dots \textcircled{4}$$

$$\textcircled{3} + \textcircled{4}: \quad 26x = 13$$

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

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

$$x^2 + y^2 = 5 \quad \dots \quad \textcircled{1}$$

$$y = 3x + 1 \quad \dots \quad \textcircled{2}$$

Substituting $y = 3x + 1$ from $\textcircled{2}$ into $\textcircled{1}$ gives:

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

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

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

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

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

$$\text{In } \textcircled{2}, \text{ when } x = \frac{2}{5}, \quad y = 3\left(\frac{2}{5}\right) + 1 = \frac{6}{5} + 1 \\ = \frac{11}{5} \text{ or } 2\frac{1}{5}$$

$$\text{and when } x = -1, \quad y = 3(-1) + 1 = -2$$

$$x = \frac{2}{5} \quad y = 2\frac{1}{5} \\ \text{or } x = -1 \quad y = -2$$

(Total 6 marks)



4. Solve the simultaneous equations

$$4x + y = -1 \quad \dots \dots \textcircled{1}$$

$$4x - 3y = 7 \quad \dots \dots \textcircled{2}$$

$$\textcircled{1} - \textcircled{2}:$$

$$4y = -8$$

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

In $\textcircled{1}$, $4x - 2 = -1$

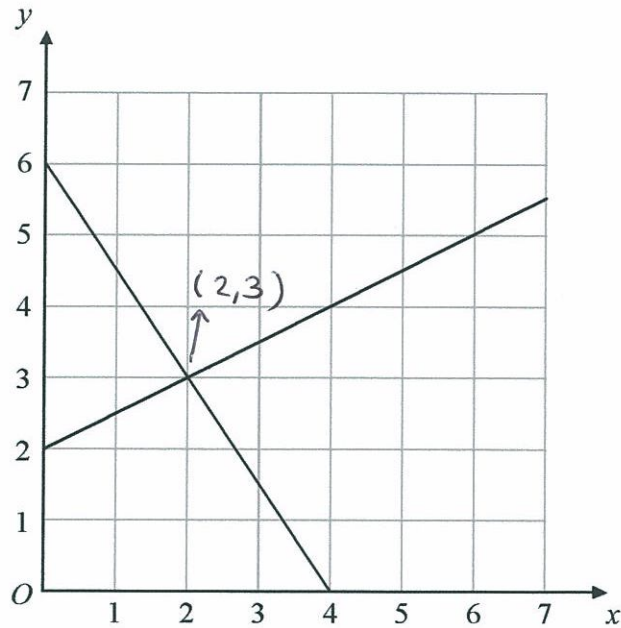
$$\Rightarrow x = \frac{-1 + 2}{4} = \frac{1}{4} \text{ or } 0.25$$

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

(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

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

$$2y + 3x = 12$$

$$x = \dots\dots\dots 2 \dots\dots\dots y = \dots\dots\dots 3 \dots\dots\dots$$

(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).

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

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

$$\Rightarrow c = 4$$

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

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

(2)

(Total 3 marks)

