



Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2018

Centre Number

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Candidate Number

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Mathematics

Assessment Unit C1

assessing

Module C1:

AS Core Mathematics 1



[AMC11]

AMC11

MONDAY 14 MAY, MORNING

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer **all eight** questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Questions which require drawing or sketching should be completed using an H.B. pencil.

All working should be clearly shown in the spaces provided. Marks may be awarded for partially correct solutions. **Answers without working may not gain full credit.**

Answers should be given to three significant figures unless otherwise stated.

You are not permitted to use any calculating aid in this paper.

INFORMATION FOR CANDIDATES

The total mark for this paper is 75

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A copy of the **Mathematical Formulae and Tables booklet** is provided.

Throughout the paper the logarithmic notation used is $\ln z$ where it is noted that $\ln z \equiv \log_e z$

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24AMC1101

- 1 **Fig. 1** below shows a sketch of the graph of the function $y = f(x)$

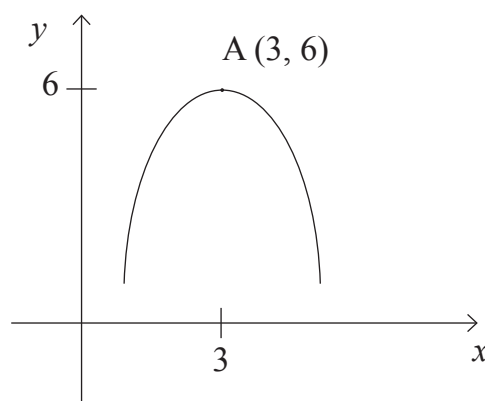


Fig. 1

Point A has coordinates (3, 6).

Sketch, on the axes opposite, the graphs of:

(i) $y = f(x) + 1$ [2]

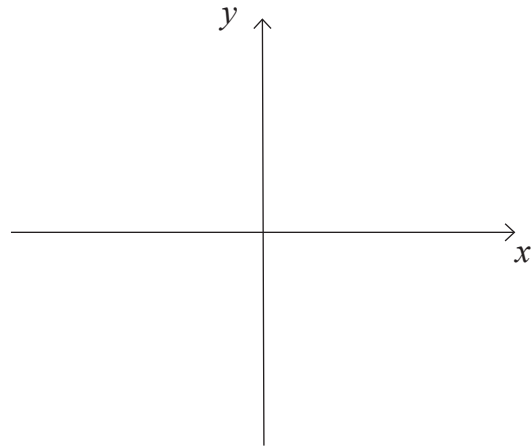
(ii) $y = \frac{1}{3}f(x)$ [2]

(iii) $y = f(-x)$ [2]

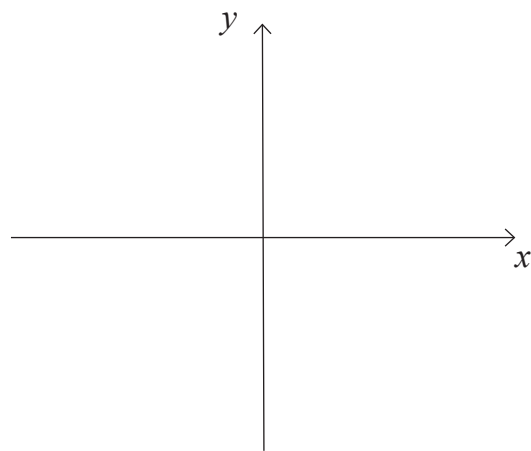
clearly labelling the image of the point A.



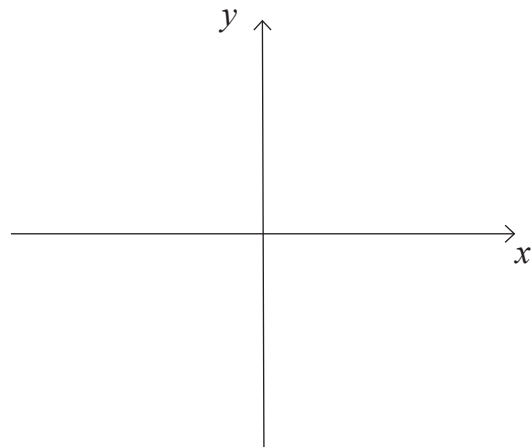
(i)



(ii)



(iii)



[Turn over]



- 2 Point A has coordinates $(7, -2)$
Point B has coordinates $(1, 10)$

(i) Find the gradient of the line AB.

[2]

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(ii) Hence find the equation of the line AB.

[2]

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(iii) Find the exact distance BP.

[3]

[illegible]

[Turn over

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24AMC1105

3 (a) Solve the simultaneous equations

$$y - 2x = 5$$

$$x^2 + 4y = 5$$

[6]

[illegible]

[6]

[illegible]

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24AMC1107

- (i) Find the values of p and q .

This image shows a single page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There are no vertical margin lines, and the paper is completely blank except for the lines.



Handwriting practice area with 20 sets of horizontal dotted lines.

[Turn over]



[3]



24AMC1110



Handwriting practice area with 20 sets of three horizontal dotted lines.

[Turn over]

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24AMC1111

5 (a) Differentiate

$$7 + 6\sqrt{x} - \frac{2}{5x^2} \quad [3]$$

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the paper.

(b) Find the equation of the normal to the curve

$$y = x^3 - 4x^2 + x$$

at the point where $x = 2$ [7]

[illegible]

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24AMC1113

-
- A diagram of a rectangle with a solid border. The top horizontal edge is labeled with a dashed line and arrows at both ends, with the variable x centered above it. The left vertical edge is labeled with a dashed line and arrows at both ends, with the variable y centered to its left. A solid vertical line divides the rectangle into two unequal parts, with the longer part on the left.

Each pitch is x metres wide and y metres long.
Fencing surrounds each pitch with one fence shared.
The length of fencing used is 240 m.

- [2]

[illegible]

[3]

This image shows a full page of white paper designed for handwriting practice. It features approximately 20 evenly spaced horizontal dotted lines running across the width of the page. There are no margins, text, or other markings present.

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(iii) Hence find the values of x and y for which the total area of the pitches

$$A = 160x - \frac{8x^2}{3}$$

is a maximum.

[6]

This image shows a single page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There are no vertical margin lines, text, or other markings on the page.

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24AMC1117

- 7 The plan for the landscaping of a rectangular plot of land is shown in **Fig. 3** below.

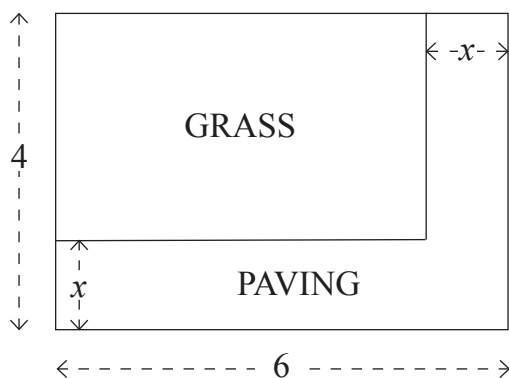


Fig. 3

The plot of land is 6 metres long and 4 metres wide.

Paving, x metres wide, runs along two of the sides.

The area of grass must be greater than the area of paving.

- (i) Show that $x^2 - 10x + 12 > 0$

[4]

[illegible]

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8 (a) A quadratic equation is of the form

$$(x - p) (x - q) = m^2$$

where p , q and m are non-zero constants.

Show that the equation will always have real roots.

[6]

[illegible]



Handwriting practice area with 20 sets of three horizontal dotted lines.

[Turn over]



(b) Show that

$$\frac{a-1}{a+\sqrt{a}} \quad [a > 0]$$

can be written in the form $1 - a^y$, stating the value of y . [5]

[illegible]

THIS IS THE END OF THE QUESTION PAPER



24AMC1123

DO NOT WRITE ON THIS PAGE

| For Examiner's use only | |
|----------------------------|-------|
| Question Number | Marks |
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

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| Total Marks | |
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Examiner Number

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24AMC1124