

Rewarding Learning

ADVANCED SUBSIDIARY (AS) General Certificate of Education 2018

#### **Mathematics**

Assessment Unit C1 assessing Module C1: AS Core Mathematics 1

### 

**Centre Number** 

**Candidate Number** 

\*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  $\ln z \equiv \log_e z$ 

### 

#### \*24AMC1101\*

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





a

#### 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.

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\*24AMC1103\*

(i)	Find the gradient of the line AB.	[
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#### (b) Solve

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 $8^x \times \left(\frac{1}{32}\right)^{1-x} = 1$ 

[6]

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

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(ii)	Hence solve the equation $f(x) = 0$	[:
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\*24AMC1111\*

(b) Find the equation of the normal to the curve $y = x^3 - 4x^2 + x$ at the point where $x = 2$ [7]			$7 + 6\sqrt{x} - \frac{2}{5r^2}$	[3]
(b) Find the equation of the normal to the curve $y = x^3 - 4x^2 + x$ at the point where $x = 2$ [7]		<u>.</u>	<i>J</i> A	
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6 An	indoor sports centre has two artificial pitches modelled as the two adjacent
rec	tangles shown in <b>Fig. 2</b> below.
	$\leftarrow x \rightarrow \leftarrow x \rightarrow$
	Fig. 2
Ea Fei Th	ch pitch is <i>x</i> metres wide and <i>y</i> metres long. ncing surrounds each pitch with one fence shared. e length of fencing used is 240 m.
(i)	Express $y$ in terms of $x$ . [2]

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(ii) Show that the total area of the pitches can be expressed as

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

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\*24AMC1116\*

$A = 160x - \frac{8x^2}{3}$		
is a maximum.		
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(i) Show that $x^2 - 10x + 12 > 0$	[4]
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$$(x-p)(x-q) = m^2$$

Show th	hat the eq	uation v	vill alw	yays ha	ve real	roots.				[6]
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**(b)** Show that

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a-1[*a* > 0]  $\overline{a + \sqrt{a}}$ 

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\*24AMC1122\*

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\*24AMC1123\*

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Question Number	Marks		
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