

New
Specification

Rewarding Learning

ADVANCED SUBSIDIARY (AS)
General Certificate of Education
2019

Centre Number

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Candidate Number

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Mathematics

Assessment Unit AS 1

assessing

Pure Mathematics



[SMT11]

SMT11

WEDNESDAY 15 MAY, MORNING

TIME

1 hour 45 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 nine** 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 permitted to use a graphic or scientific calculator in this paper.

INFORMATION FOR CANDIDATES

The total mark for this paper is 100.

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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28SMT1101



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28SMT1103

- 2 Fig. 1 below shows a sketch of the graph of the curve given by the equation $y = f(x)$.

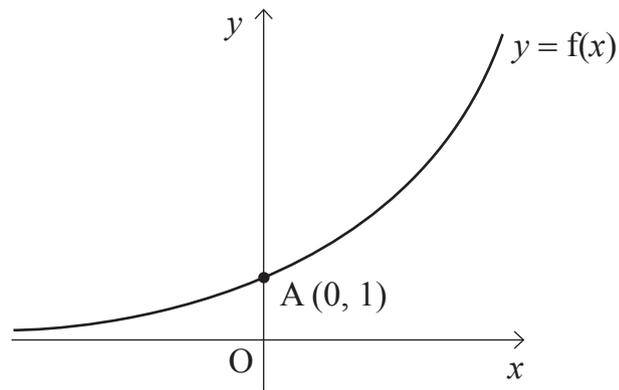


Fig. 1

Point A has coordinates (0, 1).

- (a) Write down the coordinates of the point A under the following transformations:

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

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(ii) $y = f(x - 3)$ [2]

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(iii) $y = f(-x)$

[2]

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(b) $f(x)$ has an asymptote given by the equation $y = 0$

Write down the equation of the asymptote of the curve under the transformation

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

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28SMT1123

- 9 Fig. 3 below shows a diagram of a circle with centre O.

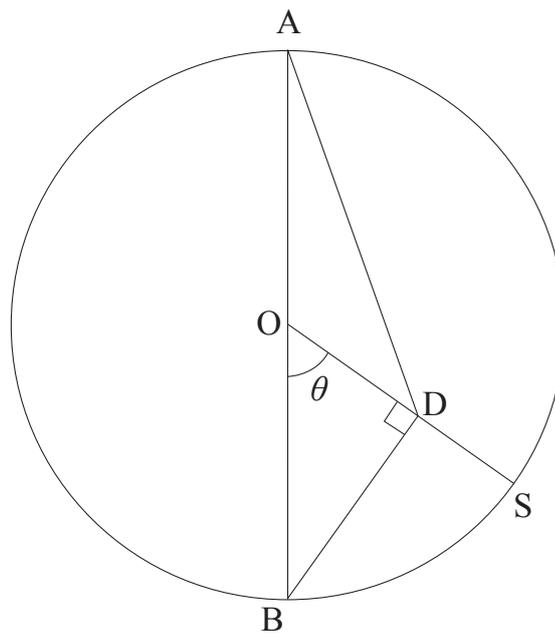


Fig. 3

AB is a diameter of the circle.
 S lies on the circumference of the circle.
 D is the foot of the perpendicular from B to OS.

The acute angle BOS is θ

$$OA = OB = r$$

$$OD = x$$

- (i) By applying the cosine rule to triangle AOD, show that

$$AD^2 = r^2 (1 + 3 \cos^2 \theta) \quad [7]$$

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For Examiner's use only	
Question Number	Marks
1	
2	
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9	

Total Marks	
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Examiner Number

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