

A7 Graphs Answers

P3

- 1 Show correct sketch for $0 \leq x < \frac{1}{2}\pi$ B1
 Show correct sketch for $\frac{1}{2}\pi < x < \frac{3}{2}\pi$ or $\frac{3}{2}\pi < x \leq 2\pi$ B1
 Show completely correct sketch B1 3
 [SR: for a graph with $y = 0$ when $x = 0, \pi, 2\pi$ but otherwise of correct shape, award B1.]

9709/03/M/J/04

- 2 (i) Make recognisable sketch of a relevant graph over the given range,
 e.g. $y = \operatorname{cosec} x$ B1
 Sketch the other relevant graph, e.g. $y = \frac{1}{2}x + 1$, and justify the given
 statement B1 2

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- 3 (i) Make recognizable sketch of a relevant graph, e.g. $y = 2\cot x$ B1
 Sketch an appropriate second graph, e.g. $y = 1 + e^x$ correctly and justify the given statement B1 2

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- 4 (i) Make a recognisable sketch of an appropriate graph, e.g. $y = \ln x$ B1
 Sketch an appropriate second graph, e.g. $y = 2 - x$, correctly and justify the given statement B1 [2]

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- 5 (i) Make recognisable sketch of a relevant graph over the given range B1
 Sketch the other relevant graph on the same diagram and justify the given statement B1 [2]

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- 6 (i) Make recognisable sketch of a relevant graph over the given range B1
 Sketch the other relevant graph and justify the given statement B1 [2]

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- 7 (i) Make recognisable sketch of a relevant graph over the given interval
Sketch the other relevant graph and justify the given statement

B1
B1 [2]

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- 8 (i) Sketch $y = \operatorname{cosec} x$ for at least $0, x, \pi$
Sketch $y = x(\pi - x)$ for at least $0, x, \pi$
Justify statement concerning two roots, with evidence of 1 and $\frac{1}{4}\pi^2$ for y -values
on graph via scales

B1
B1
B1 [3]

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- 9 (i) Sketch increasing curve with correct curvature passing through origin, for $x \geq 0$
Recognisable sketch of $y = 40 - x^3$, with equation stated, for $x > 0$
Indicate in some way the one intersection, dependent on both curves being roughly
correct and both existing for some $x < 0$

B1
B1
B1 [3]

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- 10 Draw curve with increasing gradient existing for negative and positive values of x
Draw correct curve passing through the origin

M1
A1 [2]

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- 11 (i) Make recognizable sketch of a relevant graph
Sketch the other relevant graph and justify the given statement

B1
B1
[2]

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12	(i)	Make recognizable sketch of a relevant graph Sketch the other relevant graph and justify the given statement	B1 B1	[2]
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Question		
13(i)	Use correct $\tan(A \pm B)$ formula and express the LHS in terms of $\tan x$	M1
	Using $\tan 45^\circ = 1$ express LHS as a single fraction	A1
	Use Pythagoras or correct double angle formula	M1
	Obtain given answer	A1
		4
13(ii)	Show correct sketch for one branch	B1
	Both branches correct and nothing else seen in the interval	B1
	Show asymptote at $x = 45^\circ$	B1
		3

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Question	Answer	Marks	Guidance
14 (i)	Sketch a relevant graph, e.g. $y = x^3$	B1	
	Sketch a second relevant graph, e.g. $y = 3 - x$, and justify the given statement	B1	Consideration of behaviour for $x < 0$ is needed for the second B1
		2	

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Question	Answer	Marks	Guidance
15(i)	Sketch a relevant graph, e.g. $y = \ln(x + 2)$	B1	
	Sketch a second relevant graph, e.g. $y = 4e^{-x}$, and justify the given statement	B1	Consideration of behaviour for $x < 0$ is needed for the second B1
		2	

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