Candidate	Centre	Candidate		
Name	Number	Number		
		0		



## **GCSE**

179/02

# ADDITIONAL MATHEMATICS PAPER 2

A.M. MONDAY, 28 June 2010  $1\frac{1}{2}$  hours

#### ADDITIONAL MATERIALS

A calculator will be required for this paper.

### **INSTRUCTIONS TO CANDIDATES**

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer all the questions in the spaces provided.

Take  $\pi$  as 3·14 or use the  $\pi$  button on your calculator.

#### INFORMATION FOR CANDIDATES

You should give details of your method of solution especially when a calculator is used.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part-question.

For I	Examiner's us	e only
Question	Maximum Mark	Mark Awarded
1	4	
2	8	
3	7	
4	4	
5	7	
6	6	
7	4	
8	8	
9	11	
10	8	
11	7	
12	6	
TOTAI	MARK	

(a)	Given that $y = 6x^2 + 5$ , find $\frac{dy}{dx}$ from first principles.	
	$\mathrm{d}x$	
•••••		
(b)	Find the coordinates of the point on the curve $y = 6x^2 + 5$ where the gradient of the ta	an
, ,	to the curve is $-36$ .	

	The	coordinates of the points $P$ and $Q$ are $(3,6)$ and $(15,11)$ respectively.
	(i)	Calculate the length of the line $PQ$ .
	(ii)	Find the gradient of a straight line perpendicular to $PQ$ .
		[5]
(b)		the equation of the straight line which passes through the point $(0, -3)$ and is parallel
		e line $2x - 5y + 8 = 0$ .
		e line $2x - 5y + 8 = 0$ .
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Prove that	$(x-1)(x+3)(x-2) \equiv x^3 - 7x + 6.$	
		 4]

5. The diagram shows a circle with centre O.

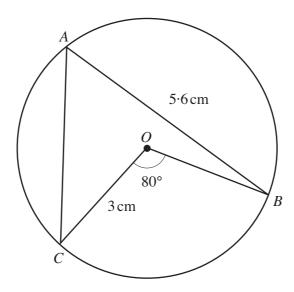


Diagram not drawn to scale.

Find the size of $\widehat{ACB}$ .
[7]

				•••••			•••••
	coordinates	of the two	points of	intersection	n of the curv	$e y = x^2 + x$	– 18 and th
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Two vertical masts stand on horizontal ground and are 350 metres at The taller mast has a height of 88 metres. From a point on the horizontal ground between the two masts, the mast is $36^{\circ}$ .	
From the same point on the horizontal ground the angle of elevation Calculate the height of the shorter mast.	n of the shorter mast is 14°.
	[8]

8.

(a)	Find $\frac{d^2y}{dx^2}$ when $y = 7x^5$ .	
(b)	Find $\int \left(7x^5 + \frac{1}{x^3} + 9\right) dx$ .	
	<b>6</b> 3	
<i>(c)</i>	Evaluate $\int_2^3 (3x^2 + 5)  \mathrm{d}x.$	

10. A print shop makes a company logo in the shape of a regular octagon as shown in the diagram below. The length of each side of the octagon is 9 cm. The print shop charges £10 per cm² for the shaded area and £5 per cm² for the unshaded area of the logo.

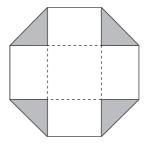


Diagram not drawn to scale.

Find the amount that the print shop charges for this logo.					
	[8]				

11. In answering this question you should assume that all the planets are spherical.

Planet	Diameter in <b>miles</b>
Venus	7520.9
Earth	7926·4
Jupiter	88846·1
Saturn	74897.6
Uranus	31763.2
Neptune	30775·2

(a)	Find the diameter of Mercury.	
(b)	The ratio of the volume of Jupiter to the volume of Saturn is $n:1$ . Find the value of $n$ correct to 3 significant figures.	[4]

12. The diagram shows a frustum of a cone.

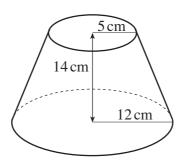


Diagram not drawn to scale.

The height of the frustum is 14 cm, the radius of the base is 12 cm and the radius of the top is 5 cm. Find the volume of the frustum.

Volume of a cone = $\frac{1}{3}\pi r^2$ h