Surname	Centre Number	Candidate Number
Other Names		0



WJEC LEVEL 2 CERTIFICATE

9550/01

ADDITIONAL MATHEMATICS

A.M. MONDAY, 24 June 2013 $2\frac{1}{2}$ hours

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

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 π as 3·14 or use the π button on your calculator.

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

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.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 4(b).

When you are asked to show your working you must include enough intermediate steps to show that a calculator has not been used.

For Examiner's use only			
Question	Maximum Mark	Mark Awarded	
1	5		
2	7		
3	7		
4	13		
5	5		
6	6		
7	11		
8	8		
9	7		
10	5		
11	5		
12	7		
13	6		
14	5		
15	3		
TOTAL MARK			

Exami	ne
only	/

1.	Find $\frac{dy}{dx}$	for each	of the	following.
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(a)
$$y = 7x^5 - 5x - 2$$





$$(b) y = x^{-6}$$

$(c) y = x^{\frac{3}{5}}$	

[1]

(a)	Factorise $8x^2 - 10x - 3$.
•••••	
	Hence solve the equation $8x^2 - 10x - 3 = 0$.
•••••	
•••••	
<i>(b)</i>	Use the method of completing the square to find the least value of $x^2 + 12x + 5$.
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•••••	
•••••	

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3.	Consider two squares of different sizes. The perimeter of the larger square is 12 cm greater than the perimeter of the smaller square. The area of the larger square is 30 cm ² greater than the area of the smaller square.
	Calculate the dimensions of each square. You must use an algebraic method, not a trial and improvement method.
	[7]

4.

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(a)	Calculate the length of the line AB . Express your answer as a surd in its simplified form $a\sqrt{b}$.
(b)	You will be assessed on the quality of your written communication in this part of the question.
	Find the equation of the straight line perpendicular to AB that passes through the midpoint of AB . Express your answer in the form $y = mx + c$.
	[10]

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Find the coord	inates of the po	oints of interse	ection of the cu	rve with equa	$tion y = x^2 + 2x - 3$
Find the coord the straight line Give your answ	e with equation	y = x + 1.		rve with equa	$tion y = x^2 + 2x - 3$
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(a) Find $\frac{d^2y}{dx^2}$ when $y = 6x^9$.	Exa
(b) Find $\int 3x^4 + \frac{1}{x^3} + 4 dx$.	[2]
$\binom{3}{5}$	[4]
(c) Showing all your working, evaluate $\int_2^3 6x^5 + 5 dx$.	
	[5]

(a)	Find	the remainder when $7x^3 - 4x^2 + x - 2$ is divided by $x - 2$.	Exa o
(b)	(i)	Show that $x + 3$ is a factor of $x^3 + 4x^2 - 17x - 60$.	[2]
	(ii)	Hence , factorise $x^3 + 4x^2 - 17x - 60$.	[2]
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9. A pyramid stands on a horizontal surface.

The base of the pyramid is in the shape of a kite.

The base of the pyramid is shown below.

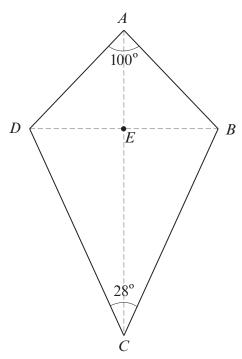


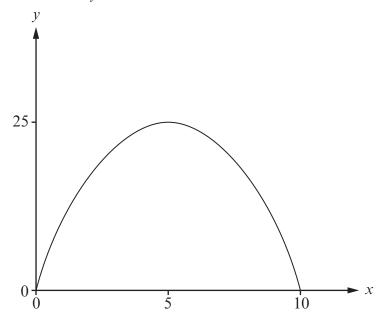
Diagram not drawn to scale

The apex (top vertex) of the pyramid is vertically above E . The vertical height of the pyramid is 17.3cm . The length of BD is 12.6cm and the angles are as shown on the diagram. Use the line EC to calculate the angle of elevation of the apex of the pyram	id from the point $\it C$.
	[7]

10.	Given that $y = x^2 - 4x$, find $\frac{dy}{dx}$ from first principles.	Exar

[5]

11. The diagram shows the curve $y = 10x - x^2$.



Showing all your working, calculate the area of the region bounded by the curve $y = 10x - x$ and the x-axis.

y = 3x = 30x + 1	nates and the na	ow all your w	orking.	
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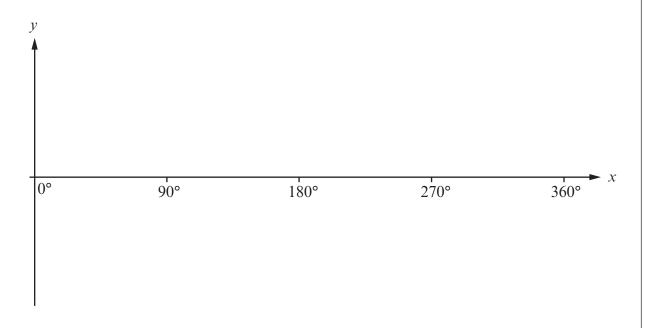
Examiner only

							Examiner only

(a)	Showing all your working, find the value of $(50^{\frac{1}{2}})^4$.	E:
		[1]
(b)	Showing all your working, simplify each of the following. (i) $\frac{3x^{-\frac{5}{4}} \times 4x^{\frac{7}{4}}}{x^{\frac{3}{2}}}$	
	(ii) $\frac{12x^{\frac{1}{6}} + 4x^{\frac{2}{6}}}{4x^{\frac{1}{6}}}$	[2]
		[2]

Examiner only

15. (a) On the axes below, sketch the graph of $y = 4 \sin x$ for values of x from 0° to 360°.



Find all the solutions of the equation $4 \sin x = 0$ for values of x from 0° to 360°.

[1]

[2]

END OF PAPER