

SPECIMEN

GENERAL CERTIFICATE OF SECONDARY EDUCATION

B280/A

MATHEMATICS C

MODULE M10 - SECTION A

SPECIMEN

Candidates answer on the question paper.

Additional Materials:

Geometrical instruments Tracing paper (optional)



Time: 30 mins

Candidate Name	
Centre Number	Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer all the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- In many questions marks will be given for a correct method even if the answer is incorrect.
- Do not write in the bar code.
- Do not write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this section is 25.

X	WARNING You	are not allowed
	to use a calculate	or in this paper.

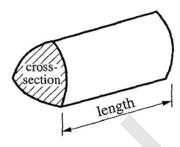
Section A

This document consists of 8 printed pages.

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FORMULAE SHEET

Volume of prism = (area of cross-section) x length

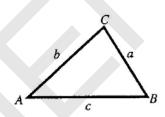


In any triangle ABC

Sine rule
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

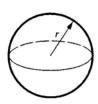
Cosine rule
$$a^2 = b^2 + c^2 - 2bc \cos A$$

Area of triangle =
$$\frac{1}{2}ab\sin C$$



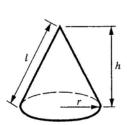
Volume of sphere $\frac{4}{3}\pi~r^3$

Surface area of sphere = $4\pi r^2$



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

Curved surface area of cone = πrl



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

1	(a)	Change	0.45	into	a fraction.
•	(ω,	Change	0.42	IIII	a machom.



(b) Expand $(5 - \sqrt{3})^2$. Write your answer in the form $a + b\sqrt{3}$.



2 The expression $x^2 - 4x - 21$ can be written in the form $(x - a)^2 - b$.

Find the values of a and b.

$$a = b = [3]$$

3

[Turn over

3 A company knows that, during the first year, the probability that a washing machine breaks down is 0.1 and that a tumble drier breaks down is 0.2.

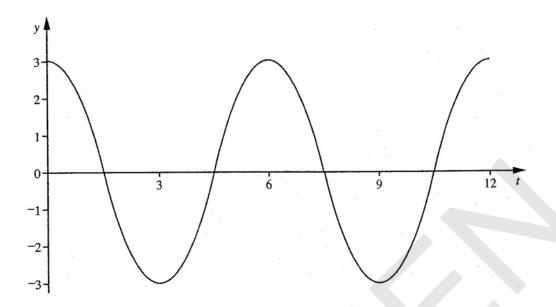
The probabilities of the events are independent.

Find the probability that either the washing machine or the tumble drier (but not both) breaks down during the first year.

[3]

3

4



5

Give **three** reasons to justify that $y = 3 \cos (60t)^{\circ}$ is the equation of the curve shown above.

1

2

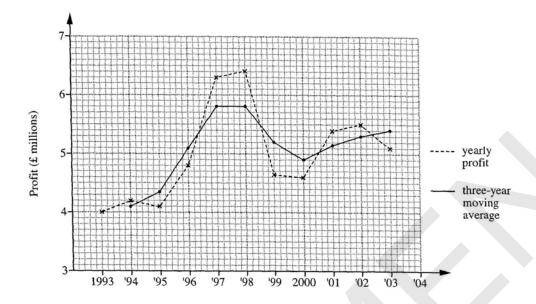
3

[3]

3

[Turn over

5 This graph shows the yearly profits for a firm and the three-year moving averages.



(a) Use the graph of the three-year moving averages to describe the trend in yearly profits.

[1]

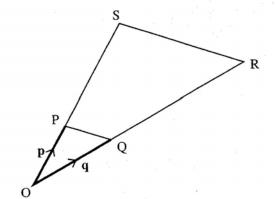
(b) The yearly profit for 2004 has been omitted.

Use the graph to help you calculate the yearly profit for 2004. Show your method clearly.

(b) £ million [2]

3

6



Not to scale

In the diagram OQR and OPS are straight lines.

$$\rightarrow$$
 OP = p OQ = q

OP : OS = 1 : 4 and OQ : OR = 1 : 4.

- (a) Work out, in terms of p and q,
 - (i) PQ,

(a)(i) [1]

(ii) SR.

(ii) _____[1]

(b) Prove that triangles OQP and ORS are similar.

4

[2]

[Turn over

7 Solve algebraically.

$$\frac{2x}{2x-5} - \frac{1}{x-4} = 1$$



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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

MATHEMATICS C

B280/A

MODULE M10 - SECTION A

Specimen Mark Scheme

The maximum mark for this paper is 25.

					ı	
1	a)	<u>5</u> or equivalent			M1	100r = 45.45
		11	2			
					A 1	45/99
	b)	28 - 10√3			M1	
	D)	20 - 10 13	2		141 1	28 or 10√3
			4			
2		<i>a</i> = 2, <i>b</i> = 25	3			allow W3 for $(x-2)^2$ - 25 isw
_		<i>a</i> 2, <i>b</i> 20	3		W1	, , ,
					VVI	$(x-a)^2 - 21 - a^2(a \pm 2 \text{ or } \pm 4)$
					W1	a = 2 (allow embedded)
					W1	b = 25 (allow embedded)
			3			
3		0.26	3		M2	0.1 x 0.8 + 0.9 x 0.2
					or M1	0.1 x 0.8 or 0.9 x0.2
			3			
4		Amplitude 3	1			
		cos because e.g. $cos 0 = 1$	1			
		period of cost t is 360 so				need 60 and 6 and
		period of $\cos t$ is $\cos t$ period of $\cos 60t$ is $360/60 =$		ľ		360/wavelength/period
		6	1			
			3			Y .
5	a)	Up then Down then				accept fluctuating / no trend
		Stable/Up	1			
	b)	55+51+x				
	~,	$(their 5.4) = \frac{5.5 + 5.1 + x}{3}$	M1			
		5.6	A1			
			3			
		Ť				

6	a)	i) q - p	1		
		ii) 4q – 4p or equivalent	1		
	b)	e.g. all lengths of ORS are		W1	OS = 4 x OP or;
		4 times lengths of OQP			OR = 4 x OQ or;
		(dependent on (a) correct)	_		4 times enlargement or;
			2		ft (a)
		or		W1	PQ and SR are parallel
		parallel and all angles the			
		same (dependent on (a) correct)			
		or		W1	Common angle and use of ratio or;
		common angle and			SF3/5
		$OS = 4 \times QP$, $OR = 4 \times QQ$			
		33 17 41, 311 1734	4		
			7		
7		2x(x-4)-(2x-5)			may be LHS or numerator of LHS;
			844		condone 1 error eg no brackets
			M1		around 2x-5
		2x(x-4)-(2x-5) = (2x-5)(x-4)			for multiplying up, or equating common numerator and
			M1		denominator
		LHS 2x ² -8x-2x+5			for expanding brackets; condone 1
			M1		error
		RHS $2x^2-5x-8x+20$	NA4		may be denominator of LHS;
		-	M1		condone 1 error
		5	W1		
			5		

Section A Total 25

Assessment Objectives Grid

Question	AO2	AO3	AO4	Total
1	4			4
2	3			3
3			3	3
4		3		3
5			3	3
6		4		4
7	5			5
Totals	12	7	6	25