OCR
RECOGNISING ACHIEVEMENT

ADVANCED SUBSIDIARY GCE

MATHEMATICS (MEI) 4752

Concepts for Advanced Mathematics (C2)

QUESTION PAPER

Candidates answer on the printed answer book.

OCR supplied materials:
- Printed answer book 4752
- MEI Examination Formulae and Tables (MF2)

Other materials required:
- Scientific or graphical calculator

Friday 20 May 2011
Afternoon

Duration: 1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

These instructions are the same on the printed answer book and the question paper.

- The question paper will be found in the centre of the printed answer book.
- Write your name, centre number and candidate number in the spaces provided on the printed answer book. Please write clearly and in capital letters.
- **Write your answer to each question in the space provided in the printed answer book.** Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- You are permitted to use a scientific or graphical calculator in this paper.
- Final answers should be given to a degree of accuracy appropriate to the context.

INFORMATION FOR CANDIDATES

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- The number of marks is given in brackets **[ ]** at the end of each question or part question on the question paper.
- You are advised that an answer may receive **no marks** unless you show sufficient detail of the working to indicate that a correct method is being used.
- The total number of marks for this paper is **72**.
- The printed answer book consists of **12** pages. The question paper consists of **4** pages. Any blank pages are indicated.

INSTRUCTION TO EXAMS OFFICER / INVIGILATOR

- Do not send this question paper for marking; it should be retained in the centre or destroyed.

Section A (36 marks)

1 Find $\int_2^5 (2x^3 + 3)\,dx$. **[3]**

2 A sequence is defined by

$$u_1 = 10,$$
$$u_{r+1} = \frac{5}{u_r^2}.$$

Calculate the values of u_2, u_3 and u_4.

What happens to the terms of the sequence as r tends to infinity? **[3]**

3 The equation of a curve is $y = \sqrt{1 + 2x}$.

(i) Calculate the gradient of the chord joining the points on the curve where $x = 4$ and $x = 4.1$. Give your answer correct to 4 decimal places. **[3]**

(ii) Showing the points you use, calculate the gradient of another chord of the curve which is a closer approximation to the gradient of the curve when $x = 4$. **[2]**

4 The graph of $y = ab^x$ passes through the points (1, 6) and (2, 3.6). Find the values of a and b. **[3]**

5 Find the equation of the normal to the curve $y = 8x^4 + 4$ at the point where $x = \frac{1}{2}$. **[5]**

6 The gradient of a curve is given by $\frac{dy}{dx} = 6\sqrt{x} - 2$. Given also that the curve passes through the point (9, 4), find the equation of the curve. **[5]**

7 Solve the equation $\tan\theta = 2\sin\theta$ for $0° \leqslant \theta \leqslant 360°$. **[4]**

8 Using logarithms, rearrange $p = st^n$ to make n the subject. **[3]**

9 You are given that

$$\log_a x = \tfrac{1}{2}\log_a 16 + \log_a 75 - 2\log_a 5.$$

Find the value of x. **[3]**

10 The nth term, t_n, of a sequence is given by

$$t_n = \sin(\theta + 180n)°.$$

Express t_1 and t_2 in terms of $\sin\theta°$. **[2]**

Section B (36 marks)

11 **(i)** The standard formulae for the volume V and total surface area A of a solid cylinder of radius r and height h are

$$V = \pi r^2 h \qquad \text{and} \qquad A = 2\pi r^2 + 2\pi rh.$$

Use these to show that, for a cylinder with $A = 200$,

$$V = 100r - \pi r^3.$$ **[4]**

(ii) Find $\frac{\mathrm{d}V}{\mathrm{d}r}$ and $\frac{\mathrm{d}^2 V}{\mathrm{d}r^2}$. **[3]**

(iii) Use calculus to find the value of r that gives a maximum value for V and hence find this maximum value, giving your answers correct to 3 significant figures. **[4]**

12 Jim and Mary are each planning monthly repayments for money they want to borrow.

(i) Jim's first payment is £500, and he plans to pay £10 less each month, so that his second payment is £490, his third is £480, and so on.

(A) Calculate his 12th payment. **[2]**

(B) He plans to make 24 payments altogether. Show that he pays £9240 in total. **[2]**

(ii) Mary's first payment is £460 and she plans to pay 2% less each month than the previous month, so that her second payment is £450.80, her third is £441.784, and so on.

(A) Calculate her 12th payment. **[2]**

(B) Show that Jim's 20th payment is less than Mary's 20th payment but that his 19th is not less than her 19th. **[3]**

(C) Mary plans to make 24 payments altogether. Calculate how much she pays in total. **[2]**

(D) How much would Mary's first payment need to be if she wishes to pay 2% less each month as before, but to pay the same in total as Jim, £9240, over the 24 months? **[2]**

[Question 13 is printed overleaf.]

13 Fig. 13.1 shows a greenhouse which is built against a wall.

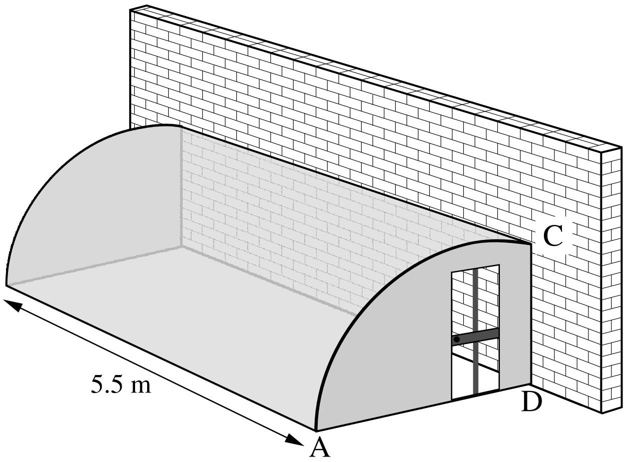

Fig. 13.1

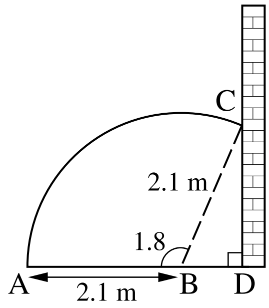

Fig. 13.2

The greenhouse is a prism of length 5.5 m. The curve AC is an arc of a circle with centre B and radius 2.1 m, as shown in Fig. 13.2. The sector angle ABC is 1.8 radians and ABD is a straight line. The curved surface of the greenhouse is covered in polythene.

(i) Find the length of the arc AC and hence find the area of polythene required for the curved surface of the greenhouse. **[4]**

(ii) Calculate the length BD. **[3]**

(iii) Calculate the volume of the greenhouse. **[5]**

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ADVANCED SUBSIDIARY GCE

MATHEMATICS (MEI) 4752

Concepts for Advanced Mathematics (C2)

PRINTED ANSWER BOOK

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- MEI Examination Formulae and Tables (MF2)

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Friday 20 May 2011
Afternoon

Duration: 1 hour 30 minutes

* 4 7 5 2 *

Candidate forename		Candidate surname	

Centre number						Candidate number				

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Section A (36 marks)

1	
2	
3 (i)	

3 (ii)	
4	
5	

6	
7	

8	
9	
10	

Section B (36 marks)

11 (i)	
11 (ii)	

11 (iii)

12(i)(A)	
12(i)(B)	
12(ii)(A)	

12(ii)(*B*)	
12(ii)(*C*)	
12(ii)(*D*)	

13 (i)	
13 (ii)	

13 (iii)	

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GCE

Mathematics (MEI)

Advanced Subsidiary GCE

Unit **4752:** Concepts for Advanced Mathematics

Mark Scheme for June 2011

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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SECTION A

1	$\frac{1}{2}x^4 + 3x$ F[5] – F[2] [=327.5 − 14] =313.5 o.e.	**M1** **M1** **A1**	accept unsimplified at least one term correctly integrated, may be implied by A1	ignore + c condone omission of brackets 313.5 unsupported scores 0
2	0.05, 2000, 1.25×10^{-6} or $\frac{1}{20}$, 2000, $\frac{1}{800000}$ o.e. divergent	**B2** **B1**	**B1** for two correct allow "alternate terms tend to zero and to infinity" o.e.	do *not* allow "oscillating", "getting bigger and smaller", "getting further apart"
3	(i) $m = \frac{\sqrt{1+2\times 4.1}-\sqrt{1+2\times 4}}{4.1-4}$ s.o.i grad = $\frac{\sqrt{9.2}-\sqrt{9}}{4.1-4}$ s.o.i 0.3315 cao	**M1** **M1** **A1**		no marks for use of Chain Rule or any other attempt to differentiate **SC2** for 0.33…. appearing only embedded in equation of chord
3	(ii) selection of value in (4, 4.1) and 4 or of two values in [3.9, 4.1] centred on 4 answer closer to 1/3 than 0.3315(...)	**M1** **A1**		allow selection of 4 and value in (3.9, 4)
4	6 = *ab* and 3.6 = ab^2 $a = 10$, $b = 0.6$ c.a.o.	**M1** **A2**	log6 = log*a* + log*b* *and* log3.6 = log*a* + logb^2 **A1** each; if **M0** then **B3** for both, **B1** for one	

5	$[\frac{dy}{dx} =]\ 32x^3$ c.a.o. substitution of $x = ½$ in their $\frac{dy}{dx}$ grad normal = $\frac{-1}{their 4}$ when $x = ½$, $y = 4 ½$ o.e. $y - 4\frac{1}{2} = -\frac{1}{4}(x - \frac{1}{2})$ i.s.w	**M1** **M1** **M1** **B1** **A1**	[= 4] $y = -\frac{1}{4}x + 4\frac{5}{8}$ o.e.	must see kx^3 their 4 must be obtained by calculus
6	$\frac{dy}{dx} = 6x^{\frac{1}{2}} - 2$ $y = kx^{\frac{3}{2}} - 2x + c$ o.e. $y = 4x^{\frac{3}{2}} - 2x + c$ o.e. correct substitution of $x = 9$ and $y = 4$ in their equation of curve $y = 4x^{\frac{3}{2}} - 2x - 86$	**M2** **A1** **M1** dep **A1**	**M1** for $k\,x^{\frac{3}{2}}$ and **M1** for -2x + c dependent on at least **M1** already awarded allow **A1** for $c = -86$ i.s.w. if simplified equation for y seen earlier	$x^{\frac{1}{6}}$ is a mistake, not a misread "y =" need not be stated at this point, but must be seen at some point for full marks must see "+ c"

7	$\frac{\sin\theta}{\cos\theta} = 2\sin\theta$ $2\cos\theta - 1 = 0$ *and* $\sin\theta = 0$ $[\theta =]$ 0, 180, 360, $[\theta =]$ 60, 300 if 4 marks awarded, lose 1 mark for extra values in the range, ignore extra values outside the range	**M1** **A1** **B1** **B1**	*may* be implied by $2\cos\theta - 1 = 0$ or better	or, if to advantage of candidate **B4** for all 5 correct **B3** for 4 correct **B2** for 3 correct **B1** for 2 correct if extra value(s) in range, deduct one mark from total do not award if values embedded in trial and improvement approach
8	$\log p = \log s + \log t^n$ $\log p = \log s + n\log t$ $[n =]\frac{\log p - \log s}{\log t}$ or $\frac{\log\left(\frac{p}{s}\right)}{\log t}$ [base not required]	**M1** **M1** **A1**	or $\frac{p}{s} = t^n$ $n\log t = \log\left(\frac{p}{s}\right)$ as final answer (i.e. penalise further incorrect simplification)	 or **A2** for $[n =]\log_t\left(\frac{p}{s}\right)$ [base t needed] following first M1
9	$\log 16^{½}$ or [–] $\log 5^2$ s.o.i. $\log(4\times75)$ or $\log\frac{75}{25}$ s.o.i. $x = 12$ www	**M1** **M1** **A1**	 $x = \frac{4\times75}{25}$ implies **M1M1**	if $a = 10$ assumed, $x = 12$ c.a.o. scores **B3** www no follow through
10	$t_1 = -\sin\theta$ $t_2 = \sin\theta$	**B1** **B1**	www www	 e.g. $\sin(\theta + 360) = \sin\theta + \sin 360 = \sin\theta$ **B0**

Section A Total: 36

SECTION B

11	(i) $200 - 2\pi r^2 = 2\pi rh$ $h = \frac{200 - 2\pi r^2}{2\pi r}$ o.e. substitution of correct h into $V = \pi r^2 h$ $V = 100r - \pi r^3$ convincingly obtained	**M1** **M1** **M1** **A1**	$100 = \pi r^2 + \pi rh$ $100r = \pi r^3 + \pi r^2 h$ $100r = \pi r^3 + V$ $V = 100r - \pi r^3$ or **M1 for** $h = \frac{V}{\pi r^2}$ **M1** for $200 = 2\pi r^2 + 2\pi r \times \frac{V}{\pi r^2}$ **M1** for $200 = 2\pi r^2 + 2\frac{V}{r}$ **A1** for $V = 100r - \pi r^3$ convincingly obtained	**sc3** for complete argument working backwards: $V = 100r - \pi r^3$ $\pi r^2 h = 100r - \pi r^3$ $\pi rh = 100 - \pi r^2$ $100 = \pi rh + \pi r^2$ $200 = A = 2\pi rh + 2\pi r^2$ **sc0** if argument is incomplete
11	(ii) $\frac{dV}{dr} = 100 - 3\pi r^2$ $\frac{d^2V}{dr^2} = -6\pi r$	**B2** **B1**	**B1** for each term	allow 9.42(….) r^2 or better if decimalised -18.8(…) r or better if decimalised

11	(iii) their $\frac{dV}{dr} = 0$ s.o.i. $r = 3.26$ c.a.o. $V = 217$ c.a.o.	**M1** **A2** **A1**	must contain r as the only variable **A1** for $r = (\pm)\sqrt{\frac{100}{3\pi}}$; may be implied by 3.25… deduct 1 mark only in this part if answers not given to 3 sf,	 there must be evidence of use of calculus

12	(i)(A) 390	**B2**	**M1** for 500 – 11 × 10	
12	(i)(B) $S_{24} = \frac{24}{2}\left(2\times500+(24-1)\times-10\right)$ o.e. i.s.w. *or* $S_{24} = \frac{24}{2}\left(500+270\right)$ o.e. i.s.w. [=9240] (answer given)	**B2**	nothing simpler than 12(1000 + 23×-10) or $\frac{24}{2}(1000-230)$ or $12(2\times500-230)$ if **B2** not awarded, then **M1** for use of a.p. formula for S_{24} with $n = 24$, $a = 500$ and $d = -10$ or **M1** for $l = 270$ s.o.i.	condone omission of final bracket or "(23)-10" if recovered in later work if they write the sum out, all the terms must be listed for 2 marks 12 × (1000 – 230) or 12 × 770 on its own do not score
12	(ii)(A) 368.33(...) or 368.34	**B2**	**M1** for 460 × 0.98^{11}	
12	(ii)(B) $J_{20} = 310$ M_{20} = 313.36(...), 313.4, 313.3, 313.37 or 313 $J_{19} = 320$ M_{19} = 319.76(...), 319.8 or 319.7	**B3**	**B3** for all 4 values correct or **B2** for 3 values correct or **B1** for 2 values correct	values which are clearly wrongly attributed do not score
12	(ii)(C) 8837 to 8837.06	**B2**	**M1** for $S_{24} = \dfrac{460\left(1-0.98^{24}\right)}{1-0.98}$ o.e.	
12	(ii)(D) $\dfrac{a(1-0.98^{24})}{(1-0.98)} = 9240$ o.e. 480.97 to 480.98	**M1** **A1**	f.t. their power of 24 from (ii)C	

13	(i) arc AC = 2.1 × 1.8 = 3.78 c.a.o. area = their 3.78 × 5.5 = 20.79 or 20.8 i.s.w.	**M1** **A1** **M1** **dep*** **A1**	$\frac{103}{360} \times 2\pi \times 2.1$ dependent on first M1	103° or better 3.78 must be seen but may be embedded in area formula
13	(ii) BD = 2.1 cos (π − 1.8) or 2.1cos1.3(4159…..) or 2.1sin0.2(292…) r.o.t to 1 d.p. or more = 0.48	**M2** **A1**	**M1** for $\cos(\pi - 1.8) = \frac{BD}{2.1}$ o.e. allow any answer which rounds to 0.48	**M2** for BD = 2.1 cos 76.8675…° or 2.1sin13.1324…rounded to 2 or more sf or **M2** for CD = 2.045... r.o.t. to 3 s.f. or better and BD = $\sqrt{(2.1^2 - 2.045^2)}$
13	(iii) sector area = 3.969 triangle area = 0.487 to 0.491 24.5	**M2** **M2** **A1**	**M1** for ½ × 2.1^2 × 1.8 **M1** for ½ × 2.1 × their 0.48 × sin (π − 1.8) *or* ½ × their 0.48 × 2.045.. r.o.t. to 3 s.f. or better allow any answer which rounds to 24.5	or equivalent with degrees for first two Ms N.B. 5.5 × 3.969 = 21.8295 so allow M2 for 21.8295 may be sin 1.8 instead of sin (π − 1.8) N.B. 5.5 × area = 2.6785 to 2.7005 so allow M2 for a value in this range

Section B Total: 36

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4752: Concepts for Advanced Mathematics (C2)

General Comments

Most candidates presented their work well and made efficient use of the answer booklet. The question paper was accessible to the majority of candidates, and there was enough challenging material to stretch even the best candidates. However, some lost easy marks through using prematurely rounded values in convoluted methods, and a surprisingly high proportion of candidates evidently failed to read the question carefully and ignored specific demands – especially finding the volume in Q11 (iii). Most found section B more straightforward than section A.

Comments on Individual Questions

1 This was done very well by most candidates. However, a few either differentiated or simply calculated f(5) – f(2), thus scoring 0, and a few made arithmetic slips, often after a bracket error. The most common integration error was $\frac{3^2}{2}$ instead of 3*x*.

2 A small minority of candidates misunderstood what to do here, using a.p. or g.p. formulae, or attempting an algebraic definition. Most were able to correctly obtain the three terms demanded. However, the descriptions of the sequence were usually too vague to score, and even those who made use of the term divergent sometimes spoiled their answers with comments like "divergent to 0".

3 (i) Generally this was well done, but a surprising number of candidates ignored the instruction to present the answer to 4 s.f. and thus lost an easy mark. $\sqrt{1+2x} = \sqrt{1} + \sqrt{2x}$ was sometimes seen, and a few candidates evaluated $\frac{x_2 - x_1}{y_2 - y_1}$, which didn't score. A small minority of candidates attempted differentiation.

3 (ii) There were many good answers to this part: most realised that a shorter *x*-step was required, and only a few of these candidates spoiled their answer by only quoting 1 or 2 s.f. in their answer.

4 Many candidates were able to write down a correct pair of equations, but then automatically used logarithms and often went wrong. Gradient = - 2.4 was often seen. A significant minority only wrote down one correct equation and produced a large amount of futile work. Many of the minority who worked with the original equations were successful, however.

5 This was generally well answered, with a high proportion gaining full marks. Nearly all candidates found the correct *y*-value, but a few wrote $\frac{dy}{dx}$ = $32x^3$ + 4 or $24x^3$ and lost an easy mark. The gradient of the tangent was often found correctly, but some candidates then worked with this value, or with $\frac{1}{4}$ or in a few cases with - $\frac{1}{8}$.

6 A few candidates went straight to *y* = m*x* + c and didn't score, and some lost marks in integrating $6\sqrt{x}$. However, most knew what to do and obtained the first three marks. A few candidates substituted (4, 9) instead of (9, 4) and made no further progress, but a pleasing proportion of the cohort obtained full marks.

7 Many candidates were unable to make the correct initial step; a significant minority began with $\tan\theta = \frac{\cos\theta}{\sin\theta}$. Even those who did start correctly often made no further progress, and very few candidates found $\sin\theta = 0$ *and* $2\cos\theta - 1 = 0$. Generally it was the former which was lost in transit. A small minority of candidates managed to obtain all five roots by adopting a graphical approach.

8 There were many fully correct answers to this question. A few candidates spoiled their answer with an incorrect further simplification – cancelling out "log" was the usual one. The most common incorrect initial step was $n\log st$, but $\log s \times \log t^n$ was also seen often.

9 The assumption that $a = 10$ followed by efficient use of calculator was sometimes seen. Those who gave the answer as 12 scored full marks – anything else scored 0. Many candidates earned a method mark for $\log 16^{\frac{1}{2}}$ or $\log 5^2$, but a significant proportion were then unable to make a second correct move. Of those who did, the work was often then spoiled by subsequent incorrect working such as $\frac{\log 300}{\log 25} = \log 12$

Of those who failed to score, $16^{\frac{1}{2}} + 75 - 25 = 54$ was perhaps the most common answer.

10 Very few candidates understood this question, and convincing fully correct answers were seldom seen. The most common approach was $\sin(\theta + 180) = \sin\theta + \sin 180$ etc., which did not score.

11 (i) Most candidates appreciated the need to work from the area formula to produce the required result, and a considerable number of legitimate approaches were seen. The algebra was too much for many weaker candidates, and the award of just the first method mark was not uncommon. A small number of candidates tried to work backwards, and they were very rarely successful.

11 (ii) This part was done very well indeed. Some candidates lost marks by omitting π or occasionally 100, and surprisingly many had the wrong sign for the second derivative. A few candidates tried to differentiate $\pi r^2 h$ and made no progress.

11 (iii) Most managed at least M1, but a few candidates set $V = 0$ or $\frac{d^2V}{dr^2} = 0$, and a few worked with > instead of "=". A number of them were unable to evaluate $\sqrt{\frac{100}{3\pi}}$ correctly, r = 10.23 was often seen. A good number of candidates ignored the demand for an answer correct to 3 s.f., or neglected to go on and find the volume, this losing an easy mark. Many candidates wasted time testing the sign of the second derivative, and a small number then went on to give negative answers for the radius and volume if their sign for the second derivative was wrong.

12 (i)(A) This was very well done, although a few candidates gave the answer as £380.

12 (i)(B) This was generally done well. Many candidates made minor bracket errors but recovered with later work. A few laboured by writing out all the terms and some failed to score because they failed to show enough detail for a "show that" demand.

12 (ii)(A) This was done very well. A few candidates worked out all the terms one by one and failed to score due to a loss of accuracy during the process.

12 (ii)(B) This was very well done, although 313.38 was a common error for Mary's 20th payment.

12 (ii)(C) This was done very well by most candidates. A few used r = 0.02 or 1.02 and failed to score, a small minority used n = 23 and a few used the corresponding a.p. formula. Those who used a trial and error approach almost never scored.

12 (ii)(D) There were many good answers to this question from candidates who had done well in the previous part, but some candidates lost a mark through premature rounding.

13 (i) Those who worked in radians often scored full marks, although some candidates just found the area of the sector as if on autopilot and ignored the length of the greenhouse. A good number of candidates preferred to work in degrees, and a proportion of these inevitably made errors in the conversion process and lost marks. A few candidates converted θ to degrees and then multiplied it by 2.1.

13 (ii) This should have been a straightforward exercise in finding a length in a right angled triangle, but many went astray because they were unable to find angle *CBD* correctly. Others chose a convoluted method such as the Sine Rule or finding CD first and using Pythagoras, and then made algebraic or arithmetic slips. It was the exception, rather than the norm, to see the expected approach of $2.1\times\cos(\pi - 1.8)$ leading to the correct answer. Some candidates lost the accuracy mark because their calculator was in the wrong mode.

13 (iii) Most candidates were able to find the area of the sector correctly, but too many candidates made finding the area of the triangle far more complicated than necessary. The usual approach was to find *CD* and then use ½base × height, and marks were often lost due to mistakes in applying the Pythagoras formula. As with part (ii), the expected approach ($\frac{1}{2} \times 2.1 \times BD \times \sin(\pi - 1.8)$) was the exception rather than the norm. Most realised the need to sum the two areas and then multiply by 5.5.

GCE Mathematics (MEI)

			Max Mark	a	b	c	d	e	u
4751/01	(C1) MEI Introduction to Advanced Mathematics	Raw	72	55	49	43	37	32	0
		UMS	100	80	70	60	50	40	0
4752/01	(C2) MEI Concepts for Advanced Mathematics	Raw	72	53	46	39	33	27	0
		UMS	100	80	70	60	50	40	0
4753/01	(C3) MEI Methods for Advanced Mathematics with Coursework: Written Paper	Raw	72	54	48	42	36	29	0
4753/02	(C3) MEI Methods for Advanced Mathematics with Coursework: Coursework	Raw	18	15	13	11	9	8	0
4753/82	(C3) MEI Methods for Advanced Mathematics with Coursework: Carried Forward Coursework Mark	Raw	18	15	13	11	9	8	0
4753	(C3) MEI Methods for Advanced Mathematics with Coursework	UMS	100	80	70	60	50	40	0
4754/01	(C4) MEI Applications of Advanced Mathematics	Raw	90	63	56	50	44	38	0
		UMS	100	80	70	60	50	40	0
4755/01	(FP1) MEI Further Concepts for Advanced Mathematics	Raw	72	59	52	45	39	33	0
		UMS	100	80	70	60	50	40	0
4756/01	(FP2) MEI Further Methods for Advanced Mathematics	Raw	72	55	48	41	34	27	0
		UMS	100	80	70	60	50	40	0
4757/01	(FP3) MEI Further Applications of Advanced Mathematics	Raw	72	55	48	42	36	30	0
		UMS	100	80	70	60	50	40	0
4758/01	(DE) MEI Differential Equations with Coursework: Written Paper	Raw	72	63	57	51	45	39	0
4758/02	(DE) MEI Differential Equations with Coursework: Coursework	Raw	18	15	13	11	9	8	0
4758/82	(DE) MEI Differential Equations with Coursework: Carried Forward Coursework Mark	Raw	18	15	13	11	9	8	0
4758	(DE) MEI Differential Equations with Coursework	UMS	100	80	70	60	50	40	0
4761/01	(M1) MEI Mechanics 1	Raw	72	60	52	44	36	28	0
		UMS	100	80	70	60	50	40	0
4762/01	(M2) MEI Mechanics 2	Raw	72	64	57	51	45	39	0
		UMS	100	80	70	60	50	40	0
4763/01	(M3) MEI Mechanics 3	Raw	72	59	51	43	35	27	0
		UMS	100	80	70	60	50	40	0
4764/01	(M4) MEI Mechanics 4	Raw	72	54	47	40	33	26	0
		UMS	100	80	70	60	50	40	0
4766/01	(S1) MEI Statistics 1	Raw	72	53	45	38	31	24	0
		UMS	100	80	70	60	50	40	0
4767/01	(S2) MEI Statistics 2	Raw	72	60	53	46	39	33	0
		UMS	100	80	70	60	50	40	0
4768/01	(S3) MEI Statistics 3	Raw	72	56	49	42	35	28	0
		UMS	100	80	70	60	50	40	0
4769/01	(S4) MEI Statistics 4	Raw	72	56	49	42	35	28	0
		UMS	100	80	70	60	50	40	0
4771/01	(D1) MEI Decision Mathematics 1	Raw	72	51	45	39	33	27	0
		UMS	100	80	70	60	50	40	0
4772/01	(D2) MEI Decision Mathematics 2	Raw	72	58	53	48	43	39	0
		UMS	100	80	70	60	50	40	0
4773/01	(DC) MEI Decision Mathematics Computation	Raw	72	46	40	34	29	24	0
		UMS	100	80	70	60	50	40	0
4776/01	(NM) MEI Numerical Methods with Coursework: Written Paper	Raw	72	62	55	49	43	36	0
4776/02	(NM) MEI Numerical Methods with Coursework: Coursework	Raw	18	14	12	10	8	7	0
4776/82	(NM) MEI Numerical Methods with Coursework: Carried Forward Coursework Mark	Raw	18	14	12	10	8	7	0
4776	(NM) MEI Numerical Methods with Coursework	UMS	100	80	70	60	50	40	0
4777/01	(NC) MEI Numerical Computation	Raw	72	55	47	39	32	25	0
		UMS	100	80	70	60	50	40	0