RECOGNISING ACHIEVEMENT

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

Mathematics C (Graduated Assessment) 1966/2343(H)

HIGHER TIER TERMINAL PAPER

MARK SCHEME

Specimen Paper 2003

SECTION A

1	**(a)**	33.5	W1	
		34.5	W1	Accept 14.499…
	(b)	103.497 to 103.5	W1	
	(c)(i)	$5.5 < m$ or $m < 6.5$	W1	For either or for $5.5 < m < 6.5$
	(ii)	5.5 (and) 6.5	W1	For both
			[5]	
2	**(a)**	$6x + 3 - 2x + 2$	M1	
		$4x + 5$	A1	Or W2 $4x + 5$
	(b)	$A - \pi r^2 = 2\pi rh$	M1	
		$h = \frac{A - \pi r^2}{2\pi r}$	A1	Or W2 for correct answer
			[4]	
3	**(a)**	Six points plotted ± 1mm	P2	P1 for 4 correct
		Smooth curve or line segments	C1	Dependent on ogive
	(b)	35.5 to 36	W1	Inclusive
			[4]	
4	**(a)(i)**	$9\frac{3}{4}$	W1	
	(ii)	$10\frac{1}{16}$	W1	
	(b)	$\frac{9}{13}$ or $\frac{91}{4}$	M1	For either
		$15\frac{3}{4}$	A1	Or W2 for $15\frac{3}{4}$
			[4]	
5	**(a)**	$\frac{2a^3b}{3}$	W2	W1 for a correct first step
	(b)	$(x + 3)(x + 4)$	M2	M1 for $(x \pm 3)(x \pm 4)$
		-3 and -4	A1	Or W3 answer only
			[5]	
6		πab	M1	
		ab = length × length = area	A1	Accept reasons why other 3 not area
			[2]	
7		$(x + 1)(x + 2) = 42$	M1	
		$x^2 + 3x - 40 = 0$	M1	
		$(x + 8)(x - 5) = 0$	M1	
		5	A1	Only
			[4]	

8		$\angle CAB + x = 90$ Tangent perp to radius $CAB + y = 90$ Angle sum triangle & angle in semi-circle	W1 W1 W1 W1 **[4]**	
9	**(a)**	6 correct points Smooth curve	W1 W1	Or M1 for at least 4 correct points
	(b)	2.4 to 2.5	W2	ft (a) M1 line $x + 3$ drawn
			[4]	
10	**(a)**	$75N = 99$ or $\frac{75}{99}$ $\frac{25}{33}$	M1 A1	
	(b)	$\frac{6+2\sqrt{12}+2}{6-2}$ $2+\sqrt{3}$	M1 A1	Accept equivalents Or W2 for $2+\sqrt{3}$
			[4]	
11	**(a)**	$\mathbf{b} - \mathbf{a}$	W1	
	(b)	$\overrightarrow{OC} = 2\mathbf{b} - \mathbf{a}$ $\overrightarrow{BC} = \mathbf{c} - \mathbf{b} = 2\mathbf{b} - \mathbf{a} - \mathbf{b}$ $\overrightarrow{BC} = \overrightarrow{AB}$	M2 M1 A1	Or M1 for $\overrightarrow{MC} = -\mathbf{a}$ seen/implied Accept equivalent methods
			[5]	
12		$x^2 + (x^2 + 12x + 36) = 50$ $x^2 + 6x - 7 = 0$ $(x + 7)(x - 1) = 0$ $x = -7, 1$ Points are $(-7, -1)$ and $(1, 7)$	M1 A1 M1 A1 A1 **[5]**	Or W4 to here For factors Ft

Section A total: 50

SECTION B

13	**(a)**	96	W1	
	(b)	78.935	W1	Accept 78.9, 79
			[2]	

14		One value between 1 and 2 correctly substituted	W1	Accept to the nearest integer or better
		An improved value substituted	W1	Accept to 1 d.p. or better
		Correct substitution of a number between 1.6 and 1.7	W1	Accept to 1 d.p. or better
		1.62	W1	Dependent on at least 2 other marks
			[4]	

15	**(a)**	0.8 seen or used	W1	
		$\sqrt{1.7^2 - 0.8^2}$ or complete trig method	M2	M1 for 1.7^2 - 0.8^2 or $\sin = \frac{0.8}{1.7}$ or $\cos = \frac{0.8}{1.7}$
		1.5	A1	Or W4 for 1.5
		$\frac{2+2.8}{2} \times 1.5$	M1	
		3.6	A1	Or W2 for 3.6
	(b)	$\tan = \frac{0.8}{1.5}$	M1	
		0.53(…)	M1	
		28(.1)	A1	Or W3 for 28(.1)
			[9]	

16		$3675.13 \div 1.07^3$	M2	Or M1 for 3434.70 or 3210
		3000	A1	Dependent on at least 1 method mark
			[3]	

17	**(a)**	$(1.1983 \times 10^8 - 1.15 \times 10^8) \div 1.15 \times 10^8$	M1	
		4 (.2)	A1	Or W2 for 4 (.2)
	(b)(i)	$6.12 \times 10^7 + 7.24 \times 10^6 + 2.16 \times 10^8$	M1	Clear intention to add
		$2.8\,(4) \times 10^8$	A1	Or W2 answer only
	(ii)	$6.12 \times 10^7 \div 213000$	M1	
		287	A1	Or W2 answer only
			[6]	

18		$\frac{12}{\sin 20} = \frac{BC}{\sin 30}$ or $\frac{AB}{\sin 130}$	M1	
		Correct expressions for BC or AB	M1	M2 if first M1 implied
		BC = 17.5 or **AB** = 26.9	A1	Or W3 to here
		BD = BC sin50 or AB sin30	M1	
		13.4(3…)	A1	Or W5 answer only
			[5]	

		Alternative scheme: BD = CD tan50 or AD tan30 CD tan50 = (CD + 12)tan30 CD = 11.27… BD = CD tan50 13.4(3…)	 M1 M1 A1 M1 A1 **[5]**	 Accept CD = BD/tan50 etc M2 if first M1 implied Or W3 to here Or W5 answer only
19		Vertical axis scaled, min two values Units: passengers(people)/year Bar heights proportional to 0.7, 1.2, 3.6, 2.1, 0.5 Bars in correct horizontal position	W1 W1 W1 W1 **[4]**	
20		$(3x + 1)(x - 2)$ $3(x^2 - 4)$ $\frac{3x+1}{3(x+2)}$	M2 M1 A1 **[4]**	M1 for $(3x \pm 1)(x \pm 2)$ Or W4 for correct answer
21	**(a)** **(b)**	$0.8 \times 0.6 + 0.2 \times 0.1$ $3 \times 0.5 \times 0.5^2$ 0.375	W2 M1 A1 **[4]**	W1 for either term
22		1, $\frac{1}{4}$, $\frac{1}{9}$ Points plotted and line drawn (a =) 18 (b =) 3	M1 M1 A1 A1 **[4]**	 Or W2 for (a =) 18 Or W2 for (b =) 3
23	**(a)** **(b)**	(20) 02/3 (20) 05/6 255 to 270 (p =) 90 to 100 (q =) 30	W1 W1 W1 W1 W1 **[5]**	

Section A total: 50

Total mark available: 100

Paper 1966 Specimen Higher Terminal

Question	Topic	NC ref	Syllabus ref	Number	Manip Alg	Other Alg	Shape	Data	UA1	UA2	UA3	Multistep	Accuracy	Units	Eff calc	Grade C	Grade B	Grade A	Grade A*	Common to 1	notes
1(a)(b)	Limits	3/4a	S8.1				3									3				3	
1(c)	Linear inequality	2/5j	A7.6		2											2					
2(a)	Expand brackets	2/5b	A6.1		2											2				2	
2(b)	Rearrangement	2/5g	A7.3		2											2				2	
3	Cum frequency	4/4a	D8.2					4									4				
4	Fractions	2/3d	N7.3	4												4					
5(a)	Simplify powers	2/5d	N8.2		2												2			2	
5(b)	Solve quadratic	2/5k	A8.2		3												3			3	
6	Dimensions	3/4a	S8.2				2				1						2				UA3:3/1F
7	Form & solve quadratic	2/5e,5k	A8.2		4												2	2			
8	Angles in circle	3/2h	S9.1				4			4		4						4			UA2:3/1e
9	Exp graph	2/6f	A9.4			4												4			
10(a)	Recurring decimal	2/2c	N10.2	2														2			
10(b)	Surd fraction	2/3n	N10.2	2															2		
11	Vectors	3/3f	S10.5				5				4	4							5		UA3:3/1f
12	Sim eqn/circle	2/5l	A10.4		5				5			5							5		
		Section A total		**8**	**20**	**4**	**14**	**4**								**13**	**13**	**12**	**12**		
13	Eff. Use calculator	2/3o	N7.1	2											2	2				2	
14	Trial & improvement	2/5m	A8.6			4									4	4				4	
15(a)	Area of trapezium, Pythagoras	3/4d,3/2f	S8.3,S6.4 S7.2				6		6			6			6	6				6	
15(b)	Trig	3/2g	S8.5				3								3		3			3	
16	Compound %	2/3k	N8.4	3											3		3				
17	Standard form	2/2b,2/3h	N8.5	6											6		6			6	
18	Sine rule	3/2g	S10.3				5		5			5			5			5			UA1:3/1a
19	Histogram	4/4q	D9.2					4		1				1				4			UA2:4/1c
20	Algebraic fractions	2/5b	A10.2		4													4			
21	Probability	4/4h,4/4g	D9.1					4		2									4		UA2:4/1c
22	Fitting data to equation	2/5h	A9.2			4													4		
23(a)	Trends in time series	4/5b	D10.2					3			3								3		UA4:1/1d
23(b)	Sine curve transformation	2/6g	A10.5		2										2				2		
		Section B total		**11**	**6**	**8**	**14**	**11**	**11**	**3**	**3**	**11**		**1**	**31**	**12**	**12**	**13**	**13**	**21**	
		Total		**19**	**26**	**12**	**28**	**15**	**16**	**7**	**8**	**24**	**0**	**1**	**31**	**25**	**25**	**25**	**25**	**33**	