GCSE 2004 November Series



Mark Scheme

Mathematics B (3302) Module 5 Paper 2 Tier I

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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The following abbreviations are used on the mark scheme:

Μ	Method marks awarded for a correct method.	
Α	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.	
В	Marks awarded independent of method.	
M dep	A method mark which is dependent on a previous method mark being awarded.	
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.	
SC	Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.	
oe	Or equivalent.	
eeoo	Each error or omission.	

MODULE 5 Paper 2 INTERMEDIATE TIER

33005/I2

1(a)	114	B1	
(b)	180 – their 114	M1	Must have a complete method eg $[360 - 2 \times 114] \div 2$
	66	A1	
2(a)	4913	B1	
(b)	7.0725	B1	or 7.1 or 7.07 or 7.073
	1		1
3(a)	2	B1	
	5	B1	or (their 2) $+ 3$
(b)	(term)11 or 11th	B1	Accept $3 \times 11 - 1 = 32$
(c)	83 and 86	M1	or $3n - 1 = 85$ 29.66 is evidence for this M1
	No term between these	A1	<i>n</i> not a whole number oe
			SC1 for 83 or 86 only
			SC2 for 3 is not a factor of 86 oe
		1	1
4	30 cm = 1 foot	B1	or other valid equivalence
	$2\frac{1}{2}$ ft = 75 cm	B1	80 cm = 2.66 ft oe
	75 < 80 No	B1	$2\frac{1}{2} < 2.66$ No
		1	
5	$10 \times \frac{8}{5}$	M1	or $5 \text{ miles} = 8 \text{ km}$
	16	A1	
			1
6(a)	x + 3	B1	Accept $H = x + 3$ not $H = G + 3$
(b)	2(x+3)	B1 ft	2 (their (a)) provided their (a) has 2 terms

33005/12

7(a)	27	B1	
(b)	1036	B1	
(c)	i) Horizontal line to 1056	B1	or line up from 1056
	Line leaving Q after 1040 and arriving at R 24 min later	M1	Tolerance on 24 min = $\pm 2 \min$
	Correct line from 1056 to 1120	A1	
	ii) 1120	B1 ft	ft where their line arrives at R Tolerance $\pm 1 \text{ min}$
8	$\frac{0+5}{2}$ or $\frac{-4+2}{2}$	M1	or evidence of good use of grid
	2.5, -1	A1	Take one or other value correct as evidence for the M1 SC1 for (-1, 2.5)
0		N/1	
9	$\pi \times 15$	MI	
	47 to 47.124	Al	
10(a)	7d or $-4e$ seen	B1	
	7 <i>d</i> – 4 <i>e</i>	B1	
(b)	12x + 28	B1	
(c)	12x = 0	M1	or $3x = 0$
	(x =) 0	A1	
11	Trial at 8.8 or 8.9 (or between)	B1	690(.272) or 713(.869)
	Trials at 8.85 (702) and 8.8	B1	or any 2 trials for $8.8 \le x \le 8.85$ which bracket 700 Note: These 2 trials score first B1 also
	8.8 or Kate	B1 dep	Dependent on second B1
			Alternative method:Trial at 8.85M1702A18.8A1

33005/12	
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 $c = \sqrt{\frac{E}{m}}$

12(a)	Reflection	B1	Do not accept mirror or flip
	y = 2	B1	
(b)	180	B1	
	(0, 3)	B1	
(c)	Triangle at $(2, -1)(5, -1)(5, -3)$	В2	B1 if translated $\begin{pmatrix} -4 \\ 1 \end{pmatrix}$ (-3, 4) (0, 4) (0, 2)
12()			
13(a)	$1.66 \le x \le 6$	MI	oe May be implied from A1 below
	2, 3, 4, 5	A2	-1 eeoo
(b)	20 = 4y	M1	
	5	A1	
(c)	$(z \pm 1)(z \pm 8)$	M1	
	(+)1	A1	Must ft from <i>their</i> brackets
	(+)8	A1	
1.4	A 1	MI	5
14	Arc drawn from any one vertex	MII	$5 \text{ cm} \pm 4 \text{ mm}$
	Arcs drawn from all vertices	M1	as above
	Correct area shaded	Al	Must be 5 cm \pm 2 mm arcs for this mark
15	$160^2 + 75^2 (25600 + 5625)$	M1	or Complete trig method
	31225	A1	
	176.7	A1	Scale drawing M0
	177 or 180	B1	Independent mark Award for any calculated value seen or implied, greater than 3 sf, that is rounded to 3 sf or 2 sf 176 only gets M1A1A0B0 177 or 180 gets full marks
16	$c^2 = \frac{E}{m}$	M1	

A1

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17	$5 \times 1.6 (= 8)$	M1	
	$\frac{1}{2}\pi \ 2.5^2 \ (= 9.817)$	M1	Allow even if $\frac{1}{2}$ is missing (= 19.63) or 5 used as radius (= 39.26) but not both
	Rectangle or semicircle \times 230	M1 dep	dep on the relevant M1
	Adding their 2 volumes or areas	M1 dep	dep on 1st and 2nd Mls
	4097 to 4100 inclusive	A1	
18	Sight of sine	M1	If sine rule used, must have correct values substituted in
	$x = 32 \times \sin 20$	M1 dep	Complete trig method scores M2
	10.9() or 11	A1	
		[
19	4(x+5) + 3(2x-1) [= 12]	M1	
	4x + 20 + 6x - 3 [= 12]	M1	
	10x = -5	M1	
	(x =) -0.5	A1	oe
			Alternative Method:
			$\frac{1}{3}x + 1\frac{2}{3} + \frac{1}{2}x - \frac{1}{4} = 1 \qquad M1$
			$\left(\frac{1}{3} + \frac{1}{2}\right)x + \left(1\frac{2}{3} - \frac{1}{4}\right) = 1$ M1
			must be good attempt at evaluation