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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Mathematics 3302

Specification B

Module 5 Paper 2 Tier I 33005/I2

Mark Scheme

2007 examination - November series

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:

M	Method marks awarded for a correct method.
A	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
B	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 INTERMEDIATE TIER 33005/I2

1(a)(i)	–60	B1	
1(a)(ii)	+27 and ÷11	M1	
	4	A1	
1(b)	6, 2 or 8, 4 or 12, 6 or 16, 3 or 24, 8 or 48, 9 or 10, 5.2 or 4.8 , 0	B1	oe

2(a)	$180 - 2 \times 76$	M1	oe Must be complete method
	28	A1	
2(b)	$(180 - (180 - 76)) \div 2$	M1	oe Must be complete method
	38	A1	

3(a)	2×5 (–) 3×-7	M1	10 (–) –21
	31	A1	SC1 for –11
3(b)	$4 \times 5 \times -7$	M1	
	–140	A1	
3(c)	$(7^2 - 4) \div 9$	M1	Allow $\frac{-7^2-4}{9}$
	5	A1	

4	$950 \times 27 \div 100$	M1	oe
	256.5	A1	Ignore subtraction from 950
	Build-up method		
	Method correct and complete but faulty arithmetic M1A0		

5(a)	4608 ÷ 32 ÷ 18	M1	oe
	8	A1	
5(b)	One correct face	B1	See diagram
	Completely correct drawing	B1	Using the isometric dots
5(c)	4608 ÷ (4 × 3 × 2)	M1	
	192	A1	
	Alternative method		
	18 ÷ 3, their 8 ÷ 2 and 32 ÷ 4 then multiplication	M1	or 18 ÷ 3, their 8 ÷ 4 and 32 ÷ 2 then multiplication
	192	A1	

6	12 inches or 1 foot = 30 cm or 6 inches = 15 cm	M1	The conversion 1 inch = 2.5(4) cm scores M2
	1 inch = 30 cm ÷ 12 (= 2.5 cm)	M1	
	32.5 and No	A1	or 33.02 and No
	Alternative method (1)		
	32 ÷ 2.5 or 2.54	M2	
	12.8 or 12.5… and No	A1	
	Alternative method (2)		
	12 inches = 30 cm	M1	
	(Extra) 1 inch = 2.5(4) cm	M1	
	2.54 > 2 and No	A1	

7(a)	23	B1	
7(b)	(0)932	B1	or (0)9.32
7(c)	Graph is not as steep or comparison of time and distance keeping one of these constant	B1	Gradient is less Must give figures
7(d)(i)	Straight line from (1010, 40) heading towards time axis in 1030 direction	M1	
	Correct line within tolerance	A1	±2 mins Continuous line ending at 1050 M1A1
7(d)(ii)	1050	B1	±2 mins

8	$\pi \times 2.7^2$	M1	
	22.9(…) or 22.89…	A1	
	23 or 22.9	B1 ft	ft mark for rounding a previously seen result to 2 sf or 1 dp

9	8.1×9.5	M1	
	76.95	A1	or 77 76.9 without working SC1

10	$360 - (2 \times 108)$	M1	oe
	(their 144) ÷ 3	M1 dep	
	48	A1	

11(a)	–1, 3 and –6	B2	B1 for any 2 of these correct
11(b)	Correct plots	B1 ft	$\pm \frac{1}{2}$ square
	Smooth curve	B1 ft	Provided 7 points
11(c)	Where graph crosses *x*-axis Where curve crosses *x*-axis Where line crosses *x*-axis	B1	No marks for just 1.7(3)

12	Trial for $3 < x \leq 4$	B1	Correctly evaluated at least to the nearest whole number
	Two trials for $3.5 \leq x \leq 3.6$ that "bracket" 56	B1	These trials correct or truncated to at least 1 dp
	Trial at 3.55 and answer 3.6	B1 dep	dep on previous B1 Accept other trials that pin the answer down to 3.6

13(a)	15, 16, 17, 18, 19, 20, 21	M1	or $\frac{14}{3} < n \leq \frac{21}{3}$
	5, 6, 7	A2	–1 each error, omission or extra If A1 given, then infer M1
13(b)	$4x + 4 – 2x + 10$	M1	Allow one error
	$2x + 14$	A1	
13(c)	$y^2 – 3y – 4y + 12$	M1	Allow one error
	$y^2 – 7y + 12$	A1	
13(d)	$(p \pm a)(p \pm b)$ where ab = 15	M1	a, b both integers
	$(p + 5)(p – 3)$	A1	

14	Arc from P cutting road twice	M1	
	Equal arcs from the intercepts	M1 dep	
	Completion of perpendicular	A1	

15	Sight of sine	M1	M2 for any complete method
	$18 \times \sin 24$	M1	
	7.3(…)	A1	No marks for scale drawing

16	Multiplication to get equal coefficients	M1	eg $4p – 6q = 26$ and $15p + 6q = 12$ or $10p – 15q = 65$ and $10p + 4q = 8$ (allow one error)
	$19p = 38$	M1 dep	$19q = –57$
	$p = 2$	A1	$q = –3$
	$q = –3$	A1	$p = 2$

17(a)	46	B1	
	Opposite angles in cyclic quad	B1	Accept “cyclic quad” or “circle quadrilateral”
17(b)	92	B1 ft	$2 \times$ their (a)
	Twice angle at circumference	B1	or “angle at centre”