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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Mathematics 3301

Specification A

Paper 1 Intermediate

Mark Scheme

2007 examination - June 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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Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
ft	Follow through marks. Marks awarded following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
oe	Or equivalent. Accept answers that are equivalent. eg, accept 0.5 as well as $\frac{1}{2}$

Paper 1I

Q	Answer	Mark	Comments
1(a)	Line drawn from $3x - x$ to $2x$	B1	
	Line drawn from $3x \times x$ to $3x^2$	B1	
	Line drawn from $3(x + 1)$ to $3x + 3$	B1	
	Line drawn from $x \times x \times x$ to x^3	B1	
1(b)	$4p + 3q$	B2	B1 For $4p$ or $3q$ fw eg, $7pq$ deduct 1 mark
2(a)	400 – (137 +128)	M1	oe
	135	A1	oe
2(b)	(Their 420) ÷ 3	M1	or (137 – 128) and (137 – Their 135) or 11 oe
	(Their 140) – 128	M1	(20 – Their 11) ÷ 3 + 9 oe
	12	A1	
3	5 – 2.72	M1	or 2.28 or 228
	(Their 228) ÷ 6 or (Their 2.28) ÷ 6	M1	oe
	38	A1	or £0.38
4(a)	180 – (90 + 36) or 90 – 36	M1	
	54	A1	
4(b)	180 – 115 or 65	M1	
	180 – (75 + Their 65)	M1dep	M2 For 115 – 75
	40	A1	
4(c)	$r = 72$	B1	
	$s = 55$	B1	

Q	Answer	Mark	Comments
5	5	B1	
	20	B2	B1 for $z = 4$
6	$\frac{60}{80} \times 100$ or $\frac{3}{4}$	M1	or Two fractions with same denominators and one correct numerator, eg, eg, $\frac{15}{20}, \frac{14}{20}$ or $\frac{300}{400}, \frac{280}{400}$ oe
	75(%) or 0.75	M1	or $\frac{15}{20}$ **and** $\frac{14}{20}$ or $\frac{300}{400}$ **and** $\frac{280}{400}$ oe
	75(%) **and** 70(%) **and** Test 1 0.75 **and** 0.7(0) **and** Test 1	A1	Correct fractions **and** Test 1
7(a)	$15 \div 3 \times 9$	M1	oe eg, 60 – 15
	45	A1	Can be recovered in (b) if missing in (a)
7(b)	45 (boys pass)	B1ft	
	35 (girls pass) **and** 25 (girls fail)	B1	

Q	Answer	Mark	Comments
8(a)	$2 \times 3 \times 4$	M1	oe
	24	A1	oe
	m^3	B1	Units mark for consistent units
8(b)	2×3 or 2×4 or 3×4	M1	or 6, 8 and 12
	$2 \times (2 \times 3 + 2 \times 4) + 3 \times 4$	M1	oe eg, $2 \times (6 + 8) + 12$ $2 \times (2 \times 3 + 2 \times 4) + 3 \times 4$
	(Their 40) ÷ 6	M1dep	oe $(6 \div 6) + (6 \div 6) + (8 \div 6) + (8 \div 6) + (12 \div 6)$
	7	A1	SC3 5 from 28 or 9 from 52 or 6 from 32 or 34 or 5 from 1 + 1 + 1.(...) + 1.(...) or 6 from 1 + 1 + 1.(...) + 2 or 6 from 1 + 1.(...) + 1.(...) + 2 or 9 from 1 + 1 + 1.(...) + 1.(...) + 2 + 2 SC2 7 with no working SC1 28 or 52 or 32 or 34 or 40 from 4 walls
9(a)	3	B1	
9(b)	2	B1	
9(c)	40	B1	
9(d)	10 ÷ 0.5	M1	oe eg, Allow 10 ÷ 30 or 0.33(3...)
	20	A1	
10(a)	$50 \times 2 + 120$	M1	or Better, eg, 100 + 120
	220	A1	
10(b)	$5 \times 200 = m + 750$	M1	or $200 = \frac{m}{5} + 150$
	250	A1	

Q	Answer	Mark	Comments
11	(64 =) 8×8	B1	or 8^2 or $\sqrt{64} = 8$ or "8 times itself"
	(64 =) $4 \times 4 \times 4$	B1	or 4^3 or $\sqrt[3]{64} = 4$
12	Correct rotation (± 2 mm)	B2	B1 for 90° any clockwise rotation (± 2 mm) or 180° rotation about C (± 2 mm) or 90° anticlockwise rotation about C (± 2 mm)
13(a)	55	B1	
13(b)	45 : Their 55	M1	oe or 11 : 9
	9 : 11	A1	
13(c)	18 ÷ (Their 9) × (Their 11)	M1	or $18 \div 45 \times 55$ oe
	22	A1	
14(a)	$\frac{3}{8}$	B2	oe B1 3 as numerator or 8 as denominator
14(b)(i)	$\frac{7}{20}$	B2	B1 7 as numerator or 20 as denominator
14(b)(ii)	(Results are) random or occur by chance	B1	or Too few spins oe
14(c)	$\frac{1}{4} \times 1\,000$	M1	oe or $\frac{250}{1000}$
	250	A1	or 250 out of 1 000

Q	Answer	Mark	Comments
15(a)	Complete explanation eg, Quadrilateral can be divided into 2 triangles **and** 2×180 Use of $(n - 2) \times 180$ with $n = 4$	B2	or Using Σexternal angles = 360° eg, Σ(Internal angles + external angles) $= 4 \times 180$ ΣInternal angles $= 4 \times 180 - 360$ B1 Partial explanation B0 2×180 only
15(b)(i)	$3x - 12 + x - 6 + 2x + 90 = 360$ or Better eg, $6x + 72 = 360$	B1	B0 $3x - 12 + x - 6 + 2x + 90 = 180$
15(b)(ii)	$6x = 288$ or $6x = 360 - 72$ or (Their 288) ÷ 6	M1	M1ft $6x = 108$ or $6x = 180 - 72$ or (Their 108) ÷ 6
	$x = 48$	A1	A1ft $x = 18$
	132	B1ft	$3 \times$ (Their x) $- 12$ for $35 \leq x \leq 63$ SC1 48 no working or T & I SC2 48 and 132 no working or T & I
16	Arcs on BA and BC **and** intersecting arcs	M1	
	Bisector from $B \pm 2°$	A1	SC1 Angle bisector based on arcs from A and C
17(a)	A and D	B1	
17(b)	All angles equal **and** 7 cm length in corresponding/matching/the same position	B1dep	oe eg, ASA $\triangle A \leftrightarrow \triangle D$ by rotation and reflection

Q	Answer	Mark	Comments
18(a)	$\frac{2}{3}$ **of** 300 or $300 \div 3 \times 2$ or $\frac{2}{3} \times 300$ or $300 - \frac{1}{3}$ **of** 300 or $\frac{2}{3} = \frac{200}{300}$	B2	B1 $\frac{1}{3}$ **of** 300 or $300 \div 3$
18(b)	$100 \div 5$ or 20	M1	oe $\frac{1}{3} \times \frac{1}{5}$
	$80 \div 2$ or 40	M1	$\frac{1}{3} \times \frac{4}{5} \times \frac{1}{2}$
	60	A1	
19(a)	x^8	B1	
19(b)	y^8	B1	
20(a)	*B*: Volume, *C*: None, *D*: Area	B2	B1 For one or two correct
20(b)	Mixed dimensions	B1dep	oe Dependent on *C* correct
21	$5x + 6y = 28$ $5x + 6y = 28$ $2x + 6y = 4$ $5x + 15y = 10$	M1	Allow error in **one** term
	$3x = 24$ $-9y = 18$	M1	Correct elimination from Their equations
	$x = 8$ **and** $y = -2$	A1	SC1 Correct answers with no working or using T & I

Q	Answer	Mark	Comments
22(a)	Jupiter	B1	
22(b)	Pluto	B1	
22(c)	Saturn	B1	
22(d)	4 880 000	B1	
22(e)	$(2.39 \times 10^6) \div 1000$	M1	or 2 390 oe
	2.39×10^3	A1	
23	Straight line (–2, –5) to (–1, –2) or (–1, –2) to (0, 1)	B2	B1 Line with constant positive gradient through (–1, –2) or Any line with gradient 3
24(a)	6	B1	
24(b)	(Girls) average (length is different to boys)	B1	oe or B1 Precise difference not related to average or spread eg, (A boy jumped) the longest length, (The girls) LQ (is different to the boys) For average allow: eg, On the whole, on average, in general, overall, median, (**not** mean or mode),… For spread allow: eg, Range, IQR, consistency, variability,…
	(Girls jump greater) spread (of lengths)	B1	
25	$\pi \times 15^2$ or $\pi \times 10^2$ (÷2)	M1	Allow use of 3.(14…)
	$225\pi - 50\pi$	M1	or $\pi \times 225$ (–) $\frac{1}{2} \times \pi \times 100$ or $3.(14\ldots) \times 175$ or 525 to 550
	175π	A1	or $\pi \times 175$ or $175 \times \pi$ SC1 for 700π