

# **General Certificate of Secondary Education**

## **Mathematics 3301** *Specification A*

### **Paper 1 Intermediate**

## **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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*Dr Michael Cresswell*, Director General.

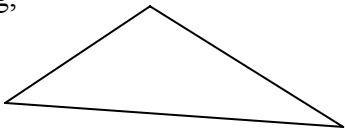
## Glossary for Mark Schemes

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.

<b>M</b>	Method marks are awarded for a correct method which could lead to a correct answer.
<b>A</b>	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>B</b>	Marks awarded independent of method.
<b>Mdep</b>	A method mark dependent on a previous method mark being awarded.
<b>Bdep</b>	A mark that can only be awarded if a previous independent mark has been awarded.
<b>ft</b>	Follow through marks. Marks awarded following a mistake in an earlier step.
<b>SC</b>	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
<b>oe</b>	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)	(0)710	B1	Allow eg, (0)7.10 or (0)7:10																
1(b)	0830	B1	Allow eg, (0)8.30 or (0)8:30																
1(c)	(0) 736 (– 0655)	M1	oe eg, 36 + 5																
	41 (minutes)	A1	SC1 for 81 or 113																
2(a)	$30 \div 5$ seen	B1	oe 30 – 27 seen																
2(b)	7	B2	B1 $22 \div 2 (-4)$ or or <b>Two</b> correct outputs for any values of $y$ or $(4 + y) \times 2 = 22$ oe or 7 embedded or 9 from $4 + y \times 2 = 22$																
3	<table border="1"> <tr> <td></td><td><i>Boys</i></td><td><b>Girls</b></td><td><i>Total</i></td></tr> <tr> <td><i>Late</i></td><td><b>3</b></td><td><i>2</i></td><td><b>5</b></td></tr> <tr> <td><b>Not late</b></td><td><b>11</b></td><td><b>14</b></td><td><b>25</b></td></tr> <tr> <td><i>Total</i></td><td><i>14</i></td><td><b>16</b></td><td><i>30</i></td></tr> </table>		<i>Boys</i>	<b>Girls</b>	<i>Total</i>	<i>Late</i>	<b>3</b>	<i>2</i>	<b>5</b>	<b>Not late</b>	<b>11</b>	<b>14</b>	<b>25</b>	<i>Total</i>	<i>14</i>	<b>16</b>	<i>30</i>	B4	B1 Girls and not late oe B1 25 or 16 B1 14 or 5 B1 3 and 11  It is possible to score B4 with <b>one</b> error; if this occurs deduct one mark
	<i>Boys</i>	<b>Girls</b>	<i>Total</i>																
<i>Late</i>	<b>3</b>	<i>2</i>	<b>5</b>																
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<i>Total</i>	<i>14</i>	<b>16</b>	<i>30</i>																
4(a)	$(1 +) 4 \times 9 = 37$	B2	B1 $(1 +) 4 \times 9$ or 37 $(1 +) 4 \times 8 = 33$ or $(1 +) 4 \times 10 = 41$																
4(b)	B	B1	oe																
5(a)	$\frac{144}{360} \times 10$	M1	oe																
	4	A1																	
5(b)	$\frac{100}{250} \times 100$	M1	or $\frac{2}{5}$ oe																
	40	A1																	
5(c)	Larger sample	B1	oe																

Q	Answer	Mark	Comments
6(a)	12 and 2.6 <b>or</b> 2.6 and 12	B1	or 14.6 seen
6(b)	1.2 and 0.26 <b>or</b> 0.26 and 1.2	B1	
6(c)(i)	2.6	B1	oe
6(c)(ii)	1.2	B1	oe
6(d)	$12 \div 0.26$	B1	Correct order only
7(a)	eg, 	B1	
7(b)	Angles in triangle add up to $180^\circ$ <b>and</b> obtuse angles $> 90^\circ$ , or two obtuse angles $> 180^\circ$ or Attempt at drawing triangle with two obtuse angles <b>and</b> explanation eg, Cannot be drawn because sides do not meet oe	B2	B1 Obtuse angles $> 90^\circ$ or Two (obtuse) angles $> 180^\circ$ or Attempt at drawing triangle with two obtuse angles (no explanation) or Explanation "Triangle cannot be drawn because the sides do not meet" oe (no drawing)
8(a)	$12x$	B1	oe <b>Not</b> $x12$
8(b)	$3x$	B1	oe <b>Not</b> $x3$
8(c)	$2(x + 3)$	B1	or $2 \times (x + 3)$ or $(x + 3) \times 2$
9(a)	3	B1	
9(b)	3 correct lines drawn $\pm 2$ mm	B2	B1 Any one correct line drawn
10(a)(i)	2 (kg)	B1	oe
10(a)(ii)	$5b = 5$	M1	oe eg, $5b = 15 - 10$
	1 (kg)	A1	oe
10(b)	$5c + \text{Their } 2 = c + \text{Their } 12$	M1	
	$(5c - c) 4c = \text{Their } (12 - 2) 10$	M2	M1 $5c - c$ or $4c$ <b>or</b> Their $(12 - 2)$ or 10
	2.5	A1	oe

Q	Answer	Mark	Comments
<b>11(a)</b>	$4 \times 3$ or 12	M1	or $24 \div 3$ or 8 <b>or</b> $24 \div 4$ or 6
	$24 \div 12$ or 2	M1	or $8 \div 4$ <b>or</b> $6 \div 3$
	Correct cuboid drawn	A1	SC1 Any cuboid drawn
<b>11(b)</b>	42	B2	B1 $2 \times 3$ or $3 \times 3$ or 6 <b>and</b> 9
	$\text{cm}^2$	B1	
<b>12</b>	$96 \pm 1$	B1	
	$(\text{Their } 96) \div 4$	M1	or $(\text{Their } 96) \times 15 (\div 60)$ oe
	24	A1	ft Their 96 for $95 \rightarrow 23.75$ and $97 \rightarrow 24.25$
<b>13</b>	$\frac{1}{2} \times (4.5 + 5.5) \times 4$	M1	or $4.5 \times 4 + \frac{1}{2} \times 4 \times 1$ oe
	20	A1	
<b>14(a)</b>	$(6 +)^{-4}$	M1	
	2	A1	
<b>14(b)</b>	$^{-2} (\div 2)$	M1	or $3 + ^{-4}$
	$^{-1}$	A1	
<b>15</b>	$(21 \div)^{\frac{7}{3}}$	M1	
	$21 \times (\text{Their } \frac{3}{7})$	M1	or $3 \div \frac{1}{3}$ or $3 \times 3$ or $21 \div 7 \times 3$ or $\frac{63}{7} \div \frac{7}{3}$
	9	A1	

Q	Answer	Mark	Comments
16	$xy + 2x$	B1	
	$xy + 2x - xy - 2$	B1	or $x(y + 2) - xy - 2$
	$2x - 2 \leftrightarrow 2(x - 1)$	B1	or $2x + 2 \leftrightarrow 2(x + 1)$ SC1 Complete correct numerical verification
17	$3.14 \times 10^2$ or 314	M1	
	$2 \times (\text{Their } 314)$	M1dep	SC1 1256 (from $3.14 \times 20^2$ )
	628	A1	SC2 2512 (from $2 \times 3.14 \times 20^2$ )
18(a)	125	B1	
18(b)	$5^6 \times 5^7$	M1	
	13	A1	or $5^{13}$
18(c)	$5^7 \div (5^4 \times 5)$	M1	or $5^{7-4-1}$ oe
	25	A1	or $5^2$
19(a)	-2 and 1	B1	
19(b)	7 correct plots from Their table	B1ft	Allow one error or omission
	$y = x^2 - 4x + 1$ plotted between $x = -1$ and $x = 5$	B1	Smooth curve within $\pm \frac{1}{2}$ square of <b>correct</b> points
19(c)	Graph intersects $x$ axis twice	B1	oe
20(a)	Angle $CAB = 35$	M1	or Angle between $DC$ extended and $CB = 35$
	$180 - 2 \times (\text{Their } 35)$	M1	
	110	A1	
20(b)(i)	160	B1	
20(b)(ii)	100	B1	

Q	Answer	Mark	Comments
21(a)	46	B1	
21(b)(i)	$180 - (18 + 29)$	M1	oe
	133	A1	
21(b)(ii)	$(3.6 \times) \frac{3}{2}$	M1	oe eg, $(3.6 \div) \frac{2}{3}$
	5.4	A1	
22(a)	$480 \times 0.2$ or $520 \times 0.3$	M1	oe
	96 or 156	A1	
	Their ( $480 \times 0.2$ ) + Their ( $520 \times 0.3$ )	M1	
	252	A1	SC2 248 (from $480 \times 0.3 + 520 \times 0.2$ ) SC1 144 or 104
22(b)	0.252	B1ft	oe eg, $\frac{63}{250}$ or 25.2%
23(a)	$4x - 3y = 13$ or $4x - 3y = 13$ $4x + 2y = 8$ $6x + 3y = 12$	M1	Allow error in one term
	$5y = -5$ or $10x = 25$	M1	Correct elimination from Their equations
	$x = 2.5$ <b>and</b> $y = -1$	A1	SC1 Correct with no working or from T&I
23(b)	$(x - 3)(x - 10)$	B2	B1 $(x \pm 3)(x \pm 10)$ or $(x - 5)(x - 6)$ or $(x \pm 2)(x \pm 15)$ or $(x - 1)(x - 30)$
24(a)	300 or 0.03	M1	
	300.03	A1	or $3.0003 \times 10^2$
24(b)	10 000 or $10^4$	B2	B1 1000 or $10^3$ from $q = 0.3$ or 100 000 or $10^5$ from $q = 0.003$ or $3 \times 10^4$ or 30 000



<b>Q</b>	<b>Answer</b>	<b>Mark</b>	<b>Comments</b>
<b>25(a)</b>	Their addition <b>and</b> $\div 4$ seen	B1	$(33.50 + 27.00 + 19.20 + 16.30) \div 4$
<b>25(b)</b>	$(27.00 + 19.20 + 16.30 + 27.50) \div 4$	M1	or $(33.5(0) - 27.5(0)) \div 4$ or $(-33.5(0) + 27.5(0)) \div 4$ or $\pm 1.5(0)$
	22.50	A1	