

GCSE

Edexcel GCSE

Mathematics A 1387

Paper 5523/03

Summer 2005

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Mark Scheme (Results)

NOTES ON MARKING PRINCIPLES

1 Types of mark

- M marks: method marks
- A marks: accuracy marks
- B marks: unconditional accuracy marks (independent of M marks)

2 Abbreviations

cao - correct answer only

ft - follow through

isw - ignore subsequent working

SC: special case

oe - or equivalent (and appropriate)

dep - dependent

indep - independent

3 No working

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.

4 With working

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

If there is no answer on the answer line then check the working for an obvious answer.

5 Follow through marks

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. incorrect cancelling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

7 Probability

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions

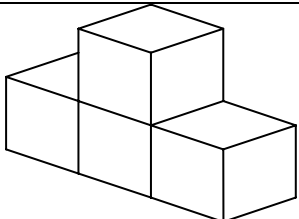
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another

Paper 5523/03				
No	Working	Answer	Mark	Notes
1		Correct shape	2	B2 B1 for any 2 sides correct, or a correct enlargement scale factor $\neq 1$ or 2.
2	(a)	11 13 16 8 21	2	B2 all correct (B1 for 2 correct) sign
	(b)	$\frac{31}{80}$	1	B1 oe
3	(a)	$2p+3q$	2	B2 for $2p+3q$ (accept $2 \times p$ etc) (B1 for $2p$ or $3q$ or $2p3q$)
	(b)	$2y^2$	1	B1 accept $2 \times y^2$ or $2 \times y \times y$
	(c)	$3c+4d$	2	B2 for $3c+4d$ (accept $3 \times c$ etc) (B1 for $3c$ or $4d$ or $3c4d$)
	(d)	$8pq$	1	B1 accept in any order but must not include \times
4	(a)(i)	60	2	B1 cao
	(ii)	eg top triangle is equilateral		B1 for reason
	(b)	150	2	M1 $\frac{(180-"60")}{2} + 90$ A1 ft from (a)(i) if $x < 90^\circ$ SC:B1 for answer from "60" + 90 if $x < 90^\circ$

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No	Working	Answer	Mark	Notes
5	(a) $4 \times 3 - 2 \times 1$ $12 - 2$	10	3	M1 for $3 \times 4 (=12)$ or 1×2 or attempt to divide diagram up into rectangles M1 "12" - "2" A1 cao
	(b)(i) $\frac{10}{100} \times 680$ or $680 \div 10$ $680 + 68$	748	5	M1 $\frac{10}{100} \times 680$ or $680 \div 10$ or 68 seen M1 (dep) 680 + "68" (or M2 for 680×1.10) A1 cao
	(ii) "748" $\div 50$ or 14.96	15		M1 for "748" $\div 50$ or 14.96; accept "748" rounded up or down to next 50 followed by $\div 50$ A1 ft from (b)(i) rounded up SC B1 for 680 (seen) leading to 14
6	(a) $2 \times 5 + 5 \times -3 = 10 - 15 =$	-5	2	M1 substitute e.g 2×5 and 5×-3 or 10 and -15 A1 cao
	(b) $5 \times 4^2 - 7$ $5 \times 16 - 7$	73	3	M1 substitution e.g $5 \times 4^2 - 7$; do not accept $54^2 - 7$ M1 $5 \times 16 - 7$ or $5 \times 4 \times 4 - 7$ or $80 - 7$ (NB 4^2 as 4×4) A1 cao

Paper 5523/03

No	Working	Answer	Mark	Notes																
7	$ \begin{array}{r} 679 \\ \underline{28} \\ 5432 \\ 13580 \\ \hline 19012 \end{array} $ <p style="text-align: center;">or</p> $ \begin{array}{r} 28 \\ \underline{679} \\ 252 \\ 1960 \\ \hline 16800 \\ 19012 \end{array} $ <p style="text-align: center;">or</p> <p style="text-align: center;">6 7 9</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> </tr> <tr> <td style="padding: 5px;">2</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">8</td> <td></td> </tr> <tr> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">7</td> <td style="padding: 5px;">8</td> </tr> <tr> <td style="padding: 5px;">8</td> <td style="padding: 5px;">6</td> <td style="padding: 5px;">2</td> <td></td> </tr> </table> <p style="text-align: center;">0 1 2</p>	1	1	1	2	2	4	8		4	5	7	8	8	6	2		190.12	3	<p>M1 for an attempt to multiply the units and tens, or correct partitioning</p> <p>M1 complete correct method (condone one arithmetic error)</p> <p>A1 for 190.12 cao</p> <p>OR</p> <p>M1 for putting the numbers in a grid</p> <p>M1 for multiplying out and addition (condone one error)</p> <p>A1 answer shown with point</p> <p>OR</p> <p>M1 for correct partitioning</p> <p>M1 679×20 and 679×8 calculated oe (condone one error)</p> <p>A1 cao</p>
1	1	1	2																	
2	4	8																		
4	5	7	8																	
8	6	2																		
8	<p>(a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	<p>Points plotted</p> <p>positive</p> <p>Line of best fit</p> <p>approx 1.65</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>B1 ± 1 full (2mm) square</p> <p>B1 cao</p> <p>B1 must pass through (42.5, 1.45), (42.5, 1.55) AND (67.5, 1.75), (67.5, 1.85)</p> <p>B1 ft from single line segment with positive gradient ± 1 full (2mm) square</p>																

Paper 5523/03				
No	Working	Answer	Mark	Notes
9	(a) eg $50 \times \frac{2000}{500}$	200	2	M1 $2000 \div 500$ or 4 seen A1 cao
	(b) eg $400 \times \frac{750}{500}$	600	2	M1 $750 \div 500$ or 1.5 seen or $400 + 200$ A1 cao
10		$C = 10(n + 3)$	3	B3 for $C = 10(n + 3)$ or such as $C = (n + 3) \times 10$ (B2 for correct RHS or $C = n + 3 \times 10$, $C = 10n + 3$ etc B1 for $C =$ some other linear expression in n or $n + 3 \times 10$, $10n + 3$ etc) NB: $C=n$ scores no marks
11	(a)	$p(p+6)$	2	B2 for $p(p+6)$ or $p \times (p+6)$ (B1 for $p(ap+b)$ where a, b are numbers or $p+6$ seen on its own, or part of an expression)
	(b) $x^2 - 4x + 7x - 28$	$x^2 + 3x - 28$	2	M1 for 4 terms correct ignoring signs (e.g. $x^2, 4x, 7x, 28$) or 3 terms with correct signs (e.g. $x^2, -4x, 7x, -28$) A1 cao
12		correct drawing	2	B2. Condone hidden detail shown with solid lines, or missing lines on front face. (B1 for : one sketch correct with other sketches incorrect cross-section correct with depth > 1 cube, correct plan and side elevation)

Paper 5523/03				
No	Working	Answer	Mark	Notes
13	$\frac{600}{3 \times 10}$ or $\frac{640}{3.2 \times 10}$	20 to 21 $\frac{1}{3}$	2	M1 For rounding at least two of the numbers to 1 sf, or for sight of 640, 3.2 or 640, 32 or 600, 32 or 30 seen A1 for 20 to 21 $\frac{1}{3}$ NB: 20.3125 scores M0 A0
14	(a) (b)	correct reflection reflection in $y = x$	2 2	B2 (B1 reflection in line other than $x=3$) B2 cao Accept the word “reflected” (B1 any statement including the word “reflection”)
15	(a)(i) (ii) (b) $x + y = 10$ and $x - y = 4$	5^6 5^3 $x = 7$ $y = 3$	1 1 3	B1 accept 15125, 5^{4+2} B1 accept 125, 5^{9-6} M1 for either $x + y = 10$ or $x - y = 4$ A2 for both values correct [(A1 for one value correct) If M0, award B3 for both values correct or B2 for one value correct, otherwise B0] SC B2 for $x = 3$ and $y = 7$

Paper 5523/03				
No	Working	Answer	Mark	Notes
16	(a) $5 - 3x = 2x + 2$ $5 - 2 = 2x + 3x$	$\frac{3}{5}$	3	B1 for $2x + 2$ seen OR $2.5 - 1.5x = x + 1$ M1 for correct rearrangement of 4 terms A1 for $\frac{3}{5}$ oe
	(b)	$-3, -2, -1, 0, 1, 2$	2	B2 (B1 for 5 correct and not more than one incorrect integers)
17		question + response boxes oe	2	1 st aspect: One question with time period (eg each night); ignore other questions. 2 nd aspect: Response list (at least two), not overlapping.* 3 rd aspect: Some mention of units (eg hours) in either question or responses Award B2 for all three aspects, or B1 for just two aspects. * 0-1, 2-3, 4-5 is OK, but 0-1, 1-2, 2-3 is not OK.

Paper 5523/03				
No	Working	Answer	Mark	Notes
18	(a) $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$	$\frac{1}{2}$	2	M1 for $\frac{6}{12}$ or $\frac{3}{6}$ or $\frac{2 \times 3}{3 \times 4}$ A1 accept 0.5
	(b) $1+2+\frac{8}{12}+\frac{9}{12}$	$4\frac{5}{12}$	3	M1 for attempt to convert to fractions with common denominator e.g two fractions, denominator of 12 A1 correct conversion : $\frac{8}{12}$ and $\frac{9}{12}$, or $\frac{20}{12}$ and $\frac{33}{12}$ seen (oe) A1 cao for $4\frac{5}{12}$ OR attempts to convert to decimals: must use at least 2dp M1 0.66+0.75 (or 1.66+2.75) or 0.67+0.75 etc A1 4.41, 4.417, 4.416 A1 4.416 (<i>recurring</i>)
19	$2 \times \frac{1}{2} \times 6 \times 8$ or 48 $8 \times 9 + 6 \times 9 + 10 \times 9$ or $72 + 54 + 90$	264 cm^2	4	M1 attempt to find the area of one face; $\frac{1}{2} \times 6 \times 8$ or (8×9) or (6×9) or (10×9) or 72 or 54 or 90 or 24 M1 all five faces with an intention to add A1 cao numerical answer of 264 B1 (indep) cm^2 with or without numerical answer

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No	Working	Answer	Mark	Notes							
20	<table border="1" style="width: 100%; height: 40px;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%; text-align: center;">$\sqrt{\quad}$</td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%;"></td> <td style="width: 15%; text-align: center;">$\sqrt{\quad}$</td> <td style="width: 15%; text-align: center;">$\sqrt{\quad}$</td> </tr> </table>		$\sqrt{\quad}$				$\sqrt{\quad}$	$\sqrt{\quad}$	$\frac{\pi ab^3}{3d}$ $3(c+d)^3$ $3\pi bc^2$	3	B3 (B1 for each one correct) Nb -B1 for each of the 4 th , 5 th , 6 th tick
	$\sqrt{\quad}$				$\sqrt{\quad}$	$\sqrt{\quad}$					
21	(a)	$x + 0.3 + 0.2 + x = 1$	0.25	2	M1 for $x + 0.3 + 0.2 + x = 1$ oe, or $0.5 \div 2$ A1 oe						
	(b)	0.3×200	60	2	M1 0.3×200 A1 cao Accept 60 out of 200 (in words) SC B1 for $\frac{60}{200}$						
22	(a)		$(-12) - 4 - 2$ (0) 8	3	B3 for all correct [(B1 for each one correct)						
	(b)		points plotted accurately points joined with smooth curve	2	B1 ± 1 full (2mm) square ft table if at least B1 awarded (all 5 points plotted) B1 ft for any smooth curve if previous B1 gained NB: curve must pass within 1 full square of the points						
23			$\frac{1}{4}$ on LH branch $\frac{2}{3}$ & $\frac{1}{3}$ & $\frac{2}{3}$ on RH branches	2	B1 B1						
24			$m=3$ $n=5$	2	B1 for 3 B1 for 5 (B2 for $2^3 \times 5$ or $2 \times 2 \times 2 \times 5$) SC: award B1 only if $m=5, n=3$ or for 8×5 seen						

Paper 5523/03				
No	Working	Answer	Mark	Notes
25	$\frac{5 - -1}{-1 - 2} = -2$	$y = -2x + 5$	4	M1 for clear attempt to find gradient eg fraction with -1,5 in numerator, 2,-1 in denominator A1 for -2 B2 ft for $y = -2x + 5$ oe (eg $y = \frac{-6}{3}x + 5$) (B1 for $y = mx + 5$ or , -2x+5 or $y = -2x + c$)
26	(a)(i) (ii) (b) 360 - 90 - 90 - "150"	150 30	2 3	B1 accept 150 or 210 B1 for angle at the centre is twice the angle at the circumference B1 identifies angle between radius and tangent as 90° (may be in working or on diagram) M1 360° - 90 - 90 - "150" A1 ft from (a)(i) excluding a negative answer OR B1 for 90 M1 for $2 \times (180 - 90 - \frac{150}{2})$ A1 ft from (a)(i) excluding a negative answer OR B3 for 180 - (a)

