

GCSE

Edexcel GCSE

Mathematics A 1387

Paper 5523/04

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 5523/04				
No	Working	Answer	Mark	Notes
1	(a) 14.44 – 8.660254038	5.77974(....)	2	M1 for 14.44 seen or 8.66(.....) seen or 5.7 or 5.8 or better, rounded or truncated
	(b)	6	1	A1 cao B1 ft
2	15 ÷ 24	62.5	2	M1 for 15 ÷ 24 or 1500 ÷ 24 or sight of digits 625 A1 cao
3	(a) 2.10 × 450	945	2	M1 for digits 210 × 450 or sight of digits 945 A1 cao
	(b) 63 ÷ 2.10	30	2	M1 for 63 ÷ digits 210 A1 cao
4	See diagram	2(y + y) 2y + 2y	2	B1 for 2(y + y) B1 for 2y + 2y (Deduct B1 for each additional tick (>2) to min 0)
5	360° ÷ 18 (=20) Sector angles: G= 60; S= 80; B=220; Correct sectors labelled correctly Use angle measurer	Angles drawn, labelled	4	B4 for fully correct and labelled pie chart (B3 for all angles correct or for a labelled pie chart with two angles correct) (B2 for labelled pie chart with one correct angle drawn) (B1 for 360 ÷ 18 or 20 seen or implied)
6	(a)	Correct plane	2	B2 for a correct plane defined by showing at least 2 lines. (B1 for a line of symmetry on one face)
	(b)	Correct net	2	B2 cao (B1 for 2 equilateral triangles joined appropriately to at least one rectangle or for 1 equilateral triangle joined appropriately to one of the three rectangles)
	(c)	Correct drawing	2	B1 for two extra sides of length 6 cm (± 2mm) B1 for construction arcs 6cm from each of the ends of the given line
7	61 – 19 = 42 42 ÷ 3 = 14	14	2	M1 for –19 or 42 seen or 3x + 19 A1 cao

Paper 5523/04				
No	Working	Answer	Mark	Notes
14	$7.60 \times \frac{17.5}{100} = 1.33$ $7.60 + 1.33 = 8.93$ $1650 \times "8.93"$	£14734.50	4	M1 for $7.60 \times \frac{17.5}{100}$ or 1.33 seen or 7.60×1.175 (oe) (Award M1 for 10%, 5% and 2½% correctly calculated) A1 for 8.93 or 893 M1 for $1650 \times "8.93"$ or digits 147345 seen A1 cao Accept 14734.5 OR M1 for 1650×7.6 or 12540 seen M1 for $"12540" \times \frac{17.5}{100}$ or 2194.5 seen or "12540"×1.175 (oe) (Award M1 for 10%, 5%, and 2½% correctly calculated) M1 for $"12540" + "2194.5"$ (dep on both previous M marks) or digits 147345 seen A1 cao accept 14734.5

Paper 5523/04				
No	Working	Answer	Mark	Notes
15	$285 \times 1000 / (60 \times 60) = 79.1\bar{6}$		3	<p>M2 for $285 \times 1000 \div 60 \div 60$ or $80 \times 60 \times 60 \div 1000$ or for a correct method to obtain two comparable values e.g $80 \times 60 \times 60$ <u>and</u> 285×1000</p> <p>(M1 for $285 \div 60 \div 60$ or $0.079(\dots)$ seen or $80 \times 60 \times 60$ or 288000 seen or for 285×1000 or 285000 seen or $80 \div 1000$ or 0.08 seen)</p> <p>A1 for 288 or $79(\dots)$ or for two correctly calculated comparable values e.g 288000 and 285000</p>
16	(a)			
	$4x + 12 = 6$ $4x = -6$	-1.5	3	<p>B1 for $4x + 12$ or $x + 3 = \frac{6}{4}$</p> <p>M1 for a correct re-arrangement of their 3 terms to isolate $4x$ or x</p> <p>A1 for -1.5 oe</p>
	(b)			
	$v - u = 5t$	$\frac{v - u}{5}$	2	<p>M1 for isolating $\pm 5t$ or $\pm t$ or for dividing through by 5</p> <p>A1 oe</p>

Paper 5523/04				
No	Working	Answer	Mark	Notes
17	3→15 4→48 3.1→17.3(91) 3.2→19.9(68) 3.3→22.7(37) 3.4→25.7(04) 3.5→28.8(75) 3.4→25.7(04) 3.3→22.7(37) 3.35→24.1(95375)	3.3	4	B2 for trial between 3.3 and 3.4 inclusive (B1 for trial between 3 and 4 inclusive) B1 for different trial between 3.3 and 3.4 exclusive B1 (dep on at least one previous B1) for 3.3 NB trials should be evaluated to at least 1 dp truncated or rounded
18	(a) $36 \div (7+3+2)$ “3” $\times 7$	21	3	M1 for $36 \div (7+3+2)$ M1 (dep) for “3” $\times 7$ or 3 or 2 A1 cao
	(b) $51.5 \times \frac{8.5}{100} = 4.3775$ $51.5 - 4.3775 = 47.1225$	47 or 47.1 or 47.12	4	M1 for $51.5 \times \frac{8.5}{100}$ or 4.37(75) seen M1 (dep) for $51.5 - “4.37(75)”$ A1 for 47 or better B1 (indep) for rounding their answer correctly to the nearest whole number or 1 or 2 d.p OR M1 for $51.5 \times \frac{100 - 8.5}{100}$ M1 for $51.5 \times “0.915”$ or $0.515 \times “91.5”$ A1 for 47 or better B1 (indep) for rounding their answer correct to the nearest whole number or 1 or 2 d.p

Paper 5523/04				
No	Working	Answer	Mark	Notes
19 (a)		Angle in a semicircle	1	B1 oe
(b)	$12^2 + 16^2 = 400$ $\sqrt{400} = 20$	20	3	M1 for $12^2 + 16^2$ M1 for $\sqrt{144 + 256}$ A1 cao
(c)	$\pi \times 10^2$	314	3	M1 for $\pi \times \left(\frac{20}{2}\right)^2$ M1 (indep) for correct order of evaluation of $\pi \times r^2$ for any r A1 for 314 – 315 inclusive

Paper 5523/04				
No	Working	Answer	Mark	Notes
20 (d)		72-74	2	M1 (ft dep on graph being cf) for reading from graph at 7 A1 ft ± 1 full (2 mm) square Or B2 for 72 – 74
21 (a) (b) (c) (d)		a^7 $15x^3y^4$ $x-1$ $(x+3)(x-3)$	1 2 1 1	B1 accept a^{4+3} B2 cao (B1 for two of 15, x^3 , y^4 in a product) B1 cao B1 cao
22	80% = 220 $220 \div 80 \times 100$	275	3	M1 for recognising that 80% is equivalent to 220 M1 for $220 \div 80 \times 100$ oe A1 cao

Paper 5523/04				
No	Working	Answer	Mark	Notes
23		$x = 3$ $y = 0.5$	3	M1 for coefficients of x or y the same followed by correct operation, condone one arithmetical error M1 (dep) for substituting found value in one equation A1 cao SC: B1 for one correct answer only if M's not awarded
24		1.4×10^{10}	2	B2 for 1.4×10^{10} or 1.44×10^{10} (B1 for 14.4×10^9 or 14400,000,000 or 14000,000,000 or 14×10^9)
25	(a) $\tan x = \frac{1.9}{3.2}$ $x = \tan^{-1}\left(\frac{1.9}{3.2}\right) = 30.7$	30.7	3	M1 for $\tan x = \frac{1.9}{3.2}$ or $\tan \frac{1.9}{3.2}$ M1 for $\tan^{-1}\left(\frac{1.9}{3.2}\right)$ A1 for 30.6 – 30.7
	(b) $90 + "30.7"$	121	1	B1 (indep) ft for $90 + "30.7"$ rounded to 3 or 4 s.f

Paper 5523/04				
No	Working	Answer	Mark	Notes
26	$SF = \frac{12}{9}$ $\frac{12}{9} \times 6 = 8$	2	2	M1 for $\frac{12}{9}$ or $\frac{9}{12}$ or 1.33... seen or 0.75 seen or 8 seen or $\frac{6}{9}$ or $\frac{9}{6}$ or 0.66... or 1.5 or $\frac{1}{3}$ or 3 oe seen A1 cao

