

Edexcel GCSE

Mathematics A 1387

Paper 5523/04

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Mark Scheme

## 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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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)	$900 \times 1.70 =$	1530	2	M1 $900 \times 1.7(0)$ or digits 153(0) seen A1 cao
	(b)	$160 \div 1.70 =$	£94.12 or £94.11	2	M1 $160 \div 1.7(0)$ or digits 941(...) seen A1 cao
2	(a)	$4.7 \div 5.9 = 0.796610169$	0.7966..	2	B2 for 0.7966 or better (B1 for 0.8, 0.80, 0.79, 0.796, 0.797 or digits 59 seen)
	(b)	0.82, 0.8, 0.85, 0.66, 0.875 0.66, 0.8, 0.82, 0.85, 0.875 2/3, 4/5, 0.82, 85%, 7/8	2/3, 4/5, 0.82, 85%, 7/8	2	B2 correct order (oe decimals in order) (B1 correct order reversed, or one error in ordered listing) with or without decimal equivalents. NB Accept 0.67 or 0.66
3		<b>55</b> 61 74 <b>190</b> 33 <b>17</b> <b>10</b> 60 <b>88</b> <b>78</b> 84 250	<b>55</b> 61 74 <b>190</b> 33 <b>17</b> <b>10</b> 60 <b>88</b> <b>78</b> 84 250	3	B3 all 6 correct (B2 for 4 or 5 entries correct) (B1 for 2 or 3 entries correct)
4	(a)	-3 (-1) (1) 3 5 7	<b>-3, 3, 5, 7</b>	2	B2 all correct (B1 2,3 correct)
	(b)	(-2,-3),(-1,-1),(0,1),(1,3),(2,5),(3,7)	line	2	B2 cao for line from $x=-2$ to $x=3$ (B1 plotting at least 5 points correctly or single line passing through (0, 1) or single line of gradient 2)
	(c)(i)		-2	2	The six possible points are: (-2,-3), (-1,-1), (0,1), (1,3), (2,5), (3,7) B1 $y=-2$ or ft from line segment
	(ii)		2.5		B1 $x=2.5$ or ft from line segment

Paper 5523_04				
No	Working	Answer	Mark	Notes
5	(a) (i) $180 - 54 (=126)$ "126" $\div 2$  (ii)  (b) $180 - "x"$	63  Reason  117	3   1	M1 for $(180-54) \div 2$ A1 cao B1 (indep) angles in triangle add to 180 OR equal angles in isosceles triangle OR equal angles and 2 sides the same (B0 if any incorrect reasoning given eg parallel, equilateral triangle) B1 117 or ft $180 - "x"$ if $x < 90$
6	$15/120 \times 360 = 45$ Plain $40/120 \times 360 = 120$ Cheese & Onion $55/120 \times 360 = 165$ Salt & Vinegar $10/120 \times 360 = 30$ Beef	$45^\circ, 120^\circ,$ $165^\circ, 30^\circ$	4	M1 evidence of method for at least one angle (could be implied by one correct angle of four on pie chart or in the table) A2 All four angles drawn $\pm 2^\circ$ tolerance, any order (A1 at least 2 angles correctly drawn $\pm 2^\circ$ , or all 4 angles in the table) B1 (dep on at least 1 angle drawn correctly, and exactly 4 sectors) for labels (flavour or frequency; initials will do) NB: Ignore the table if the pie chart provides the marks.
7	(a) $260 - 50 = 210$ $210 \div 35 =$  (b)	6   $P=35h + 50$	3   3	M1 for $260-50$ or $210$ seen. M1 for " $260-50$ " $\div 35$ or $210 \div 35$ A1 cao B3 for $P=35h+50$ or $P=35 \times h+50$ oe (B2 for correct RHS or $P=h + 50 \times 35$ or $P=35h+k$ where $k$ is numerical oe) (B1 for $P =$ some other linear expression in $h$ , OR $h + 50 \times 35$ OR $35h$ seen) NB: $P=h$ scores no marks; ignore £ signs. SC B2 for $h = \frac{P-50}{35}$
8	(a) 	Elevation	2	B2 for 4 vertical squares. Accept 4 by 1 rectangle. (B1 for 4 vertical squares with one square added or one parallelogram added at the top, or 3 vertical squares, or 4 horizontal squares)

**Paper 5523\_04**

No	Working	Answer	Mark	Notes
(b)		Plan	2	B2 for 2 adjacent squares, vertical or horizontal. Accept 2 by 1 rectangle. (B1 for 3 adjacent horizontal or vertical squares or a rectangle with sides in the ratio 2:1)
9	(a)	Points	1	B1 all three points $\pm 1$ full square.
	(b)	Negative	1	B1 Negative. Ignore other descriptors unless contradictory.
	(c)	lobf	1	B1 A single straight line drawn to cross between (5,30), (5,40) and (40,0), (40,15); accept freehand if considered to be straight.
	(d)(i)	18–25	2	B1 18g–25g inclusive OR if not in this range ft $\pm 1$ square dep on single straight line with negative gradient.
	(ii)	30–40		B1 30–40 min inclusive OR if not in this range ft $\pm 1$ square dep on single straight line with negative gradient.
10		300, 3, 75, 150	3	B3 for 4 correct (B2 for 2 or 3 correct) (B1 for 1 correct)
11	(a)	$6x - 7 + 7 = 38 + 7$ $6x = 45$	2	M1 $6x = 45$ or $+7$ both sides A1 7.5 oe; accept 45/6
	(b)	$5y - 2 = 10$ or $20y - 8 = 40$ $5y = 12$ $20y = 48$	3	M1 $20y - 8 (=40)$ or $\frac{4(5y - 2)}{4} = \frac{40}{4}$ or $5y - 2 = 10$ M1 (indep) for correct rearrangement into the form $ay = b + c$ or better (eg $20y = 40 + 8$ or $5y = 10 + 2$ , using own terms) A1 for $2\frac{2}{5}$ , 2.4 oe
12	5 miles = 8 km $70\text{mph} \div 5 \times 8 = 122 \text{ km/h}$ OR $120\text{km/h} \div 8 \times 8 = 75 \text{ mph}$ Faster than 70 mph	70mph (Great Britain) (112 km)	3	M1 5 miles = 8 km; OR 70 mph is about 100 km/h OR 1km=0.6(25) miles OR 1mile=1.6km oe M1 $70 \div 5 \times 8 (=112)$ or $120 \div 8 \times 5 (=75)$ oe A1 (dep on at least M1) GB or 70 mph Refer to both answer line and working. NB GB or 70 mph without working scores 0 marks.

**Paper 5523\_04**

No	Working	Answer	Mark	Notes
13 (a)	$\pi \times 0.65$	2.04–2.05	2	M1 for $\pi \times 0.65$ or $3.14 \times 0.65$ or $3.142 \times 0.65$ oe A1 2.04–2.05
13 (b)	$1000 \div \text{“(a)”}$	487–491	2	SC Award B1 for 2.0 seen (not 2) M1 for $1000$ (or $100$ ) $\div$ “(a)” A1 for 487–491
14	$45.00 + 45.00 \times \frac{15}{100} =$ $45.00 + 6.75 =$	51.75	3	M2 for $45.00 + 45.00 \times \frac{15}{100}$ oe or $45.00 \times 1.15$ oe OR $45.00 + 6.75$ OR complete method or 5175 seen. (M1 for $45.00 \times \frac{15}{100}$ oe OR 6.75 seen OR 675 seen OR correct method for calculating 15% of 45) A1 cao SC Award B2 for an answer of 38.25
15		273	2	M1 for $728 \div 8$ or $728 \div \text{“3+5”}$ or 91 A1 cao SC B1 for 455, or for 273:455
16	3 24 3.7 46.9(53) 4 60 3.8 51.0(72) 3.1 26.6(91) 3.9 55.4(19) 3.2 29.5(68) 3.21 29.8(66...) 3.3 32.6(37) 3.22 30.1(66...) 3.4 35.9(04) 3.23 30.4(68..) 3.5 39.3(75) 3.24 30.7(72...) 3.6 43.0(56) 3.25 31.0(78...) or 31	3.2	4	B2 for trial between 3.2 and 3.3 inclusive (B1 for trial between 3 and 4 inclusive) B1 for different trial between 3.21 and 3.25 inclusive B1 (dep on at least one previous B1) cao for 3.2 as final answer. NB: embedded answers: –B1; award Bs for evaluations rounded or truncated to at least 1 dp or for 31

**Paper 5523\_04**

No	Working	Answer	Mark	Notes
17	$45^2 + 34^2 =$ $2025 + 1156 = 3181$ $\sqrt{3181} = 56.4$	56	4	M1 for $45^2 + 34^2$ M1 (dep) for $\sqrt{(2025 + 1156)}$ A1 for 56.4 ... B1 for rounding their diagonal to the nearest integer (dep on evidence from decimal) NB 56 as the final answer gets full marks. NB Scale drawings result in 0 marks.
18	$2000 \times (1.055)^3$ Interest = $2348.48 - 2000 =$	348.48	3	M1 for $5.5/100 \times 2000$ (oe) or 330 or 2330 or 110 or 2110 M1 (dep) for $5.5/100 \times (2000 + "110" + "116.05")$ or 122.4... seen A1 cao (accept only 348.48 or 348.49) <b>OR</b> M2 for $2000 \times (1.055)^3$ or 2348.48(...) or 2348.49 seen (M1 for $2000 \times (1.055)^n, n \neq 3$ ) A1 for 348.48 or 348.49 [SC: B2 for 2348.48 - 2348.49]
19		Line	2	B2 line fully within tramlines, crossing AB and CD (B1 a straight line which crosses AB within the tramline, and also crosses CD) NB: Accept dotted or dashed lines, but not curves; accept freehand if considered to be straight. SC B1 for a perpendicular bisector of AB that is at least half way from AB to CD within the tramlines
20	(a) (b) $65 \times 12 = 780$ $75 \times 22 = 1650$ $85 \times 23 = 1955$ $95 \times 24 = 2280$ $105 \times 19 = 1995$ $8660/100 =$	$90 < t \leq 100$  86.6	1  4	B1 for $90 < t \leq 100$ ; accept 90-100.  M1 for use of $fx$ with $x$ consistent within intervals (including end points). Allow one slip. M1 (dep) for use of midpoints M1 (dep on 1 <sup>st</sup> M1) for use of $\sum fx/100$ or $\sum fx/\sum f$ A1 86.6



**Paper 5523\_04**

No	Working	Answer	Mark	Notes
21	<p>(a) <math>8 \times \frac{10}{4}</math></p> <p>(b) <math>15 \times \frac{4}{10}</math></p>	<p>20</p> <p>6</p>	<p>2</p> <p>2</p>	<p>M1 <math>\frac{10}{4}</math> or <math>\frac{4}{10}</math> or 0.4 or 2.5 oe seen                      A1 cao                      NB ratios get M0 unless of the form 1:n                      OR                      M1 <math>\frac{8}{4}, \frac{4}{8}</math> oe seen                      A1 cao                      M1 <math>15 \times \frac{4}{10}</math> oe                      A1 cao</p>
22	<p>(a) <math>x^2 - 4x + 3x - 12 = x^2 - x - 12</math></p> <p>(b) <math>(x+2)(x+5)</math></p> <p>(c) <math>6=15+4q-20</math>    <math>6-15=4(q-5)</math>  <math>p-3t=4q-4t</math>    <math>6-3 \times 5=4(q-5)</math></p>	<p><math>x^2-x-12</math></p> <p><math>(x+2)(x+5)</math></p> <p><math>2 \frac{3}{4}</math></p>	<p>2</p> <p>2</p> <p>3</p>	<p>M1 for exactly 4 terms correct ignoring signs (eg <math>x^2, 4x, 3x, 12</math>) or 3 correct terms out of 4 terms with correct signs (eg 3 out of 4 of <math>x^2, -4x, +3x, -12</math>)                      A1 cao                      B2 cao                      (B1 for exactly one of <math>(x+2), (x+5)</math>)                      M1 for correct substitution of <math>p</math> and <math>t</math>.                      M1 for correct expansion of <math>4(q-t)</math> oe (eg <math>4q-20, 4q-4t</math>)                      A1 <math>11/4</math> or <math>2 \frac{3}{4}</math> or 2.75                      OR                      M1 for correct substitution of <math>p</math> and <math>t</math>.                      M1 for <math>\frac{p-3t}{4} = q-t</math> oe                      A1 <math>11/4</math> or <math>2 \frac{3}{4}</math> or 2.75</p>

Paper 5523_04				
No	Working	Answer	Mark	Notes
23	(a) $9.9 \times 10^8 - 6.0 \times 10^7$	$9.3 \times 10^8$	2	M1 for $99 \times 10^7 - 6 \times 10^7$ or $9.9 \times 10^8 - 0.6 \times 10^8$ or conversion of either to an ordinary number, or 930000000 or $93 \times 10^7$ or $9.3 \times 10^n$ where $n$ is any positive integer A1 cao
	(b) $\frac{6.0 - 4.5}{4.5} \times 100 = \frac{1.5}{4.5} \times 100 =$ or $\frac{6.0 \times 10^7 - 4.5 \times 10^7}{4.5 \times 10^7} \times 100$	33.3%	3	M2 $\frac{6.0 \times 10^7 - 4.5 \times 10^7}{4.5 \times 10^7} \times 100$ oe (M1 for $\frac{6.0 \times 10^7 - 4.5 \times 10^7}{4.5 \times 10^7}$ or $\frac{6.0 \times 10^7 - 4.5 \times 10^7}{6.0 \times 10^7} \times 100$ oe A1 cao OR M2 $\frac{6.0 \times 10^7}{4.5 \times 10^7} \times 100 - 100 =$ (M1 $\frac{6.0 \times 10^7}{4.5 \times 10^7} \times 100$ or 133.33(%)) A1 cao NB Accept any of the above expressions without any reference to $10^7$ .
24	LCM (40,24) = 120 Bread buns $120 \div 40$ Burgers $120 \div 24$ OR Bread buns: 40 is $2 \times 2 \times 2$ ( $\times 5$ ) Burgers: 24 is $2 \times 2 \times 2$ ( $\times 3$ )	Bread buns 3 Burgers 5	3	M1 attempt to find LCM by eg lists of multiples, or summing of 40 and 24. A1 identify 120 (as LCM) A1 cao (both) OR M1 expansion of either number into its prime factors in a factor tree or $8 \times 5$ or $8 \times 3$ A1 both expansions correct A1 cao (both) SC B2 if answers given the wrong way around

**Paper 5523\_04**

<b>No</b>	<b>Working</b>	<b>Answer</b>	<b>Mark</b>	<b>Notes</b>
25	$8 \times 41 = 328$ $2 \times 29 = 58$ $328 - 58 = 270$ $270 \div 6 = 45$	45	3	M1 for either $8 \times 41 (=328)$ or $2 \times 29 (=58)$ M1 (dep) “328” – “58” (=270) A1 cao NB 328 and/or 58 on the answer line gets M1 (implied); 270 on the answer line gets M2 (implied)