

Edexcel GCSE

Mathematics B 2544

Paper 5543H/ 11

November 2007

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

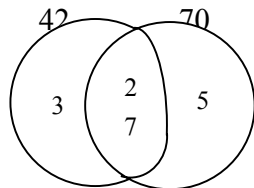
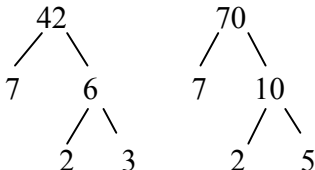
Remember: if you are having difficulty making a decision on how you should mark a candidate response contact your Team Leader for advice, or send the item to review.

5543H - Section A				
No	Working	Answer	Mark	Notes
1	$6549 - 5137 (=1412)$ $"1412" \times 52 (=73424)$ $"73424" \div 100$ <u>Alternative</u> $6549 \times 52 (=340548)$ $5137 \times 52 (=267124)$ $"340548" \div 100 -$ $"267124" \div 100$	734.24	4	M1 for $6549 - 5137 (=1412)$ M1 (dep) for $"1412" \times 52 (=73424)$ M1 for $"73424" \div 100$ (this depends upon $"73424"$ being arrived at by a direct product of 52 and units given in the question) A1 cao <u>Alternative</u> M1 for $6549 \times 52 (=340548)$ or $5137 \times 52 (=267124)$ M1 for $"340548" \div 100$ or $"267124" \div 100$ (this depends upon $"340548"$ or $"267124"$ being arrived at by a direct product of 52 and units given in the question) M1 (dep on 1 st M1) for $"340548" - "267124"$ or $"340548 \div 100" - "267124 \div 100"$ A1 cao
2 (a)		$3x + 6$	1	B1 for $3x + 6$ oe
(b)		$5(t + 4)$	1	B1 for $5(t + 4)$ oe
3 (a)		$-7, -1, 5$	2	B2 for all values correct (B1 for 1 or 2 values correct)
(b)		Line from $(-2, -7)$ to $(2, 5)$	2	B2 for straight line from $(-2, -7)$ to $(2, 5)$ [B1ft for at least four points correctly plotted or B1 for a single line of gradient 3 or B1 for a single line passing through $(0, -1)$]
4		$2n + 1$	2	B2 for $2n + 1$ oe [for example: $3 + (n - 1)2$] [Accept: $n\text{th} = 2n + 1$, $n\text{th term} = 2n + 1$, $T_n = 2n + 1$, $x = 2n + 1$, $n = 2x + 1$ oe] (B1 for $2n + k$ ($k \neq 1$) or $n = 2n+1$ or $x = 2x + 1$)

5543H - Section A				
No	Working	Answer	Mark	Notes
5 (a)	$60 \times 24 (=1440)$	1440	2	M1 for $60 \times 24 (=1440)$ A1 cao
(b)	$648 \div "1440"$	0.45	2	M1 ft for $648 \div "1440"$ A1 ft for "0.45"
6		3×10^5	2	M1 for sight of 90 000 000 and 300 or 300 000 or $3 \times 10^7 \div 10^2$ A1 cao
7	$180 - 104 (=76)$ $"76" \div 2 (=38)$ $90 - "38"$ $104 \div 2$	52	3	M1 for $(180 - 104) \div 2$ or $180 - 90 - 104 \div 2$ or 38 seen on the diagram for angle <i>BAO</i> M1 for $90 - "angle\ BAO"$ (This could be implied by the values of angle <i>BAO</i> and angle <i>BAT</i> shown on the diagram) A1 for 52° (shown to be their final answer, other than just shown on the diagram) Alternative method (using angle at centre and alternate segment theorems) M2 for $104 \div 2$ seen leading directly to their final answer. A1 cao
8	$\frac{4(x-3)}{(x+5)(x-3)} + \frac{(x+5)}{(x+5)(x-3)}$ $\frac{4(x-3) + (x+5)}{(x+5)(x-3)}$ $\frac{4x-12+x+5}{(x+5)(x-3)}$	$\frac{5x-7}{(x+5)(x-3)}$	4	M1 for a denominator of $(x+5)(x-3)$ common to two fractions with the clear intention to add M1 for either $\frac{4(x-3)}{(x+5)(x-3)}$ or $\frac{(x+5)}{(x+5)(x-3)}$ M1 (dep on 2 nd M1) for $\frac{4(x-3) + (x+5)}{(x+5)(x-3)}$ A1 for $\frac{5x-7}{(x+5)(x-3)}$ or $\frac{5x-7}{x^2+2x-15}$

5543H - Section B				
No	Working	Answer	Mark	Notes
1	$180 - 113$ $(360 - 2 \times 113) \div 2$	67°	2	M1 for $180 - 113$ A1 cao OR M1 for $(360 - 2 \times 113) \div 2$ A1 cao Remember to look on the diagram
2		12.5	1	B1 for 12.5 (with or without units) or 125mm (units must be included if an answer of 125 is given)
3	$6x + 15 + 12x + 4$	$18x + 19$	2	M1 for $6x + 15$ or $12x + 4$ seen A1 for $18x + 19$ oe (eg. $19 + 18x$, $18 \times x + 19$)
4 (a)		(10, 4, 0)	1	B1 cao
(b)	(10 \div 2, 4 \div 2, 0)	(5, 2, 0)	2	M1 for two correct coordinates or for two of “10” \div 2, “4” \div 2, “0” \div 2, ft from (a) A1 ft from (a)
5	$(2 \times \frac{1}{2} \times 12 \times 5) + 13 \times 20 + 12 \times 20 + 5 \times 20$	660	3	M1 for $\frac{1}{2} \times 12 \times 5$ (=30) or 13×20 (=260) or 12×20 (=240) or 5×20 (=100) M1 for $2 \times "30" + "260" + 240" + "100"$ (condone the omission of one face) A1 cao
6		$(x - 3)(x + 5)$	2	M1 for $(x \pm 3)(x \pm 5)$, ignoring signs A1 cao
7 (a)		5	1	B1 accept 5 or +5 and -5 or ± 5 or -5
(b)		1	1	B1 cao

5543H - Section B

No	Working	Answer	Mark	Notes									
8	$42 = 2 \times 3 \times 7$ $70 = 2 \times 5 \times 7$ Alternative:  Alternative 	210	2	M1 for $2 \times 3 \times 7$ or $2 \times 5 \times 7$ or a list of at least 3 multiples of 42 and a list of at least 3 multiples of 70 (condone one error in each list) A1 for 210 or an equivalent product, eg. $2 \times 3 \times 5 \times 7$ [SC: B1 for any correct common multiple if M0 scored. This could be written as a product, eg. $2 \times 3 \times 7 \times 2 \times 5 \times 7$] Alternative: M1 for a fully correct Venn Diagram A1 for 210 or an equivalent product, eg. $2 \times 3 \times 5 \times 7$ Alternative M1 for two fully correct factor trees A1 for 210 or an equivalent product, eg. $2 \times 3 \times 5 \times 7$									
9	$15x^2 - 3x + 20x - 4$ <table><tr><td style="border-right: 1px solid black; padding: 0 5px;"></td><td style="padding: 0 5px;">$3x$</td><td style="padding: 0 5px;">4</td></tr><tr><td style="border-right: 1px solid black; padding: 0 5px;">$5x$</td><td style="padding: 0 5px;">$15x^2$</td><td style="padding: 0 5px;">$20x$</td></tr><tr><td style="border-right: 1px solid black; padding: 0 5px;">-1</td><td style="padding: 0 5px;">$-3x$</td><td style="padding: 0 5px;">-4</td></tr></table>		$3x$	4	$5x$	$15x^2$	$20x$	-1	$-3x$	-4	$15x^2 + 17x - 4$	2	B2 cao (B1 for 4 correct terms with or without signs, or 3 out of no more than 4 terms, with correct signs. The terms may be in an expression or in a table, etc.)
	$3x$	4											
$5x$	$15x^2$	$20x$											
-1	$-3x$	-4											

5543H - Section B				
No	Working	Answer	Mark	Notes
10	$x = 2.1454545\dots$ $10x = 21.454545\dots$ $1000x = 2145.4545\dots$ $990x = 2124$	$2\frac{8}{55}$ oe	3	M1 for $2.14545(45\dots)$ or $0.14545(45\dots)$ [1000x = 2145.45 for example would imply this] M1 for two recurring decimals that, when subtracted, leave a terminating decimal A1 for $2\frac{8}{55}$ oe (eg $\frac{2124}{990}$) [Note: $\frac{212.4}{99}$ gets M2 A0]
11	$\frac{4(a-5)}{(a+5)(a-5)}$	$\frac{4}{a+5}$	3	M1 for $4(a-5)$ M1 for $(a+5)(a-5)$ A1 cao