

Edexcel GCSE

Mathematics B 1388

Paper 5536/16

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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No	Working	Answer	Mark	Notes
1		Cuboid drawn	2	B2 for correct isometric drawing in any orientation (ignore points 'behind', mark 7 vertices only); accept lines drawn near to dots as long as there is no ambiguity. (B1 for one of the three faces drawn correctly OR for an isometric drawing of any cuboid)
2	Different makes of car Tally Frequency	Make of car Tally Frequency	3	B1 for make of car or list of at least 3 different makes B1 for tally or tally marks B1 for frequency or totals
3		6 tessellating shapes	2	B2 for fully correct with 5 or more additional shapes, no gaps (B1 for 4 or more shapes tessellating with at least one shape inverted, with or without the given shape, ignore extras)

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No	Working	Answer	Mark	Notes																																																
4	$\begin{array}{r} 315 \\ \underline{24} \\ 1260 \\ \underline{6300} \\ 7560 \end{array} \quad \begin{array}{r} 24 \\ \underline{315} \\ 120 \\ 240 \\ \underline{7200} \\ 7560 \end{array}$ <table border="1" style="display: inline-table; margin-right: 10px;"> <tr> <td style="text-align: center;"><b>3</b></td> <td style="text-align: center;"><b>1</b></td> <td style="text-align: center;"><b>5</b></td> <td></td> </tr> <tr> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">1</td> <td style="text-align: center;"><b>2</b></td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">2</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">0</td> <td style="text-align: center;">2</td> <td style="text-align: center;"><b>4</b></td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">4</td> <td style="text-align: center;">0</td> <td></td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">5</td> <td style="text-align: center;">6</td> <td style="text-align: center;">0</td> </tr> </table> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr> <td style="text-align: center;"><b>300</b></td> <td style="text-align: center;"><b>10</b></td> <td style="text-align: center;"><b>5</b></td> <td></td> </tr> <tr> <td style="text-align: center;">6000</td> <td style="text-align: center;">200</td> <td style="text-align: center;">100</td> <td style="text-align: center;"><b>20</b></td> </tr> <tr> <td style="text-align: center;">1200</td> <td style="text-align: center;">40</td> <td style="text-align: center;">20</td> <td style="text-align: center;"><b>4</b></td> </tr> </table> <p>6000+200+100+1200+40+20 = 7560</p> <table border="1" style="display: inline-table; margin-right: 10px;"> <tr> <td style="text-align: center;"><b>3</b></td> <td style="text-align: center;"><b>0.1</b></td> <td style="text-align: center;"><b>0.05</b></td> <td></td> </tr> <tr> <td style="text-align: center;">60</td> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> <td style="text-align: center;"><b>20</b></td> </tr> <tr> <td style="text-align: center;">12</td> <td style="text-align: center;">0.4</td> <td style="text-align: center;">0.2</td> <td style="text-align: center;"><b>4</b></td> </tr> </table> <p>60 + 2 + 1 + 12 + 0.4 + 0.2 = 75.6</p>	<b>3</b>	<b>1</b>	<b>5</b>		0	0	1	<b>2</b>	6	2	0		1	0	2	<b>4</b>	2	4	0		7	5	6	0	<b>300</b>	<b>10</b>	<b>5</b>		6000	200	100	<b>20</b>	1200	40	20	<b>4</b>	<b>3</b>	<b>0.1</b>	<b>0.05</b>		60	2	1	<b>20</b>	12	0.4	0.2	<b>4</b>	75.6(0)	3	<p>M1 for a complete method with relative place value correct.                      Condone 1 multiplication error, addition not necessary.</p> <p><b>OR</b></p> <p>M1 for a complete grid with not more than 1 multiplication error, addition not necessary.</p> <p><b>OR</b></p> <p>M1 for sight of a complete partitioning method, condone 1 multiplication error, final addition not necessary.</p> <p>A1 for 7560 or digits 756(0)</p> <p>A1 (dep on M1, but not previous A1) for correct placement of decimal point.</p>
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No	Working	Answer	Mark	Notes
5	<p>15 and 16 parts shaded</p> <p>Alternative 1  <math>\frac{3}{4} = 0.75</math> or 75%, <math>\frac{4}{5} = 0.8</math> or 80%</p> <p>Alternative 2  <math>\frac{3}{4} = \frac{15}{20}</math>, <math>\frac{4}{5} = \frac{16}{20}</math></p>	$\frac{4}{5}$ + reason	3	<p>M1 for shading 15 parts for <math>\frac{3}{4}</math></p> <p>M1 for shading 16 parts for <math>\frac{4}{5}</math></p> <p>A1 (<b>dep on M2</b>) for selection of <math>\frac{4}{5}</math> with correct shading</p> <p>Alternative 1</p> <p>M1 for <math>\frac{3}{4} = 0.75</math> or 75%</p> <p>M1 for <math>\frac{4}{5} = 0.8</math> or 80%</p> <p>A1 (<b>dep on M2</b>) for selection of 0.8 or 80% or <math>\frac{4}{5}</math> with correct decimals or percentages</p> <p>Alternative 2</p> <p>M1 for <math>\frac{3}{4} = \frac{15}{20}</math> oe</p> <p>M1 for <math>\frac{4}{5} = \frac{16}{20}</math> oe</p> <p>A1 (<b>dep on M2</b>) for selection of <math>\frac{4}{5}</math> or <math>\frac{16}{20}</math> with equivalent fractions</p>

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No	Working	Answer	Mark	Notes
6	$36 \div 9 (=4)$ “4” $\times$ 6 Alternative $\frac{2}{3}$ of 36	24	2	M1 for $36 \div 9$ or 4 seen or $0.36 \div 9$ or 0.04 seen A1 cao Alternative M1 for $\frac{2}{3}$ of 36 A1 cao
7	(a)	$\frac{7}{20}$	1	B1 for $\frac{7}{20}$ oe
	(b)	0	1	B1 for 0, zero or nought ( $\frac{0}{20}$ gets B0)
8	$5 \times 5 \times 6$	150	4	M1 for attempt at 1 division (e.g. $40 \div 8$ ), may be implied by marks or number on one edge of diagram or by 5 or 6 seen M1 for attempt at 3 divisions ( $40 \div 8$ , $40 \div 8$ , $60 \div 10$ ), may be implied by marks or numbers on diagram or by 5,5 and 6 seen. M1 (dep on 1 <sup>st</sup> M1) for “5” $\times$ “5” $\times$ “6” A1 cao  Alternatively M1 for $40 \times 40 \times 60$ or $8 \times 8 \times 10$ or 96000 or 640 seen M1 for $40 \times 40 \times 60$ <b>and</b> $8 \times 8 \times 10$ or 96000 <b>and</b> 640 seen M1 (dep on 1 <sup>st</sup> M1) for “(40 $\times$ 40 $\times$ 60)” $\div$ “(8 $\times$ 8 $\times$ 10)” A1 cao  SC:B1 for dividing area of one carton face by area of corresponding box face if M0

Paper 5536_16				
No	Working	Answer	Mark	Notes
9	(a)	$80x$	1	B1 for $80x$ (accept $80 \times x$ , $x80$ , $x \times 80$ ) seen
	(b)	$95y$	1	B1 for $95y$ (accept $95 \times y$ , $y95$ , $y \times 95$ ) seen
	(c)	$80x + 95y$	2	M1ft for adding “ $80x$ ” and “ $95y$ ” (algebraic expressions only) A1 for $80x + 95y$ or $x80 + y95$
10	(a)	$3 \times 3 - 4 \times 2$ or $9 - 8$	2	M1 for substitution of 3 and 2 into expression or 9 and 8 seen A1 cao
	(b)	$-7 - 3 = -10$ $2 \times -10 = -20$ $-20 \div 4$	3	M1 for substitution of 2 and $-7$ into $p(q - 3)$ or sight of $-20$ or $-14 - 6$ M1 (dep) for “ $-20$ ” $\div 4$ SC: B1 for sight of $-10$ if M0 A1 cao
11	(a)	40	1	B1 cao
	(b)	45	1	B1 for 42 to 48 (accept $3/4$ <b>hour</b> )
	(c)	$40 \times 2$ or $\frac{40}{30} \times 60$ or $40 \div \frac{1}{2}$	2	M1 for $40 \times 2$ or $\frac{40}{30}$ or $40 \div \frac{1}{2}$ A1 cao  NB $\frac{40}{45} \times 60$ gets M0 A0
12		(2,4)	2	B2 {B1 for either (2, y) or (x, 4)} could be implied by a labelled diagram <b>OR</b> M1 for $(7 + -3) \div 2$ or $(6 + 2) \div 2$ A1 for both coordinates correct



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No	Working	Answer	Mark	Notes
13		$\frac{\pi a^2 + ab}{a(3d + b)}$ $\frac{\pi ab^2}{3d}$	3	B3 all correct (B2 for 2 correct) (B1 for 1 correct) Subtract one mark to a minimum of zero for each of 4 <sup>th</sup> , 5 <sup>th</sup> , 6 <sup>th</sup> tick
14	$x \times 3 - x \times 2x^2$	$3x - 2x^3$	2	B2 cao (B1 for $3x$ or $\pm 2x^3$ or $x \times 3 - x \times 2x^2$ )
15	$8 \times 1000000$	8000000	2	M1 for 1000000 or $(100)^3$ oe or $(200)^3$ oe A1 cao
16	(a) (i)	180 – 2 × 25	3	M1 for 180 – 2 × 25
	(ii)	Reason		A1 cao
	(b)	180 – 95	1	B1 for mentioning isosceles and equal (or base) angles or equal sides and equal (or base) angles B1 cao
17	(a)(i)	$7^5$	3	B1 cao
	(ii)	$7^4$		B2 cao
	(b)	$\frac{1}{2}$	1	(B1 for sight of $7^5$ or $7^{2+3}$ or $7 \times 7^3$ or $7^2 \times 7^2$ or $7 \times 7^3$ or $7^1 \times 7^3$ or $7^{2+3-1}$ ) B1 for $\frac{1}{2}$ or 0.5 or $2^{-1}$

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No	Working	Answer	Mark	Notes
18	$\frac{8}{3} \times \frac{5}{4} = \frac{8 \times 5}{3 \times 4} = \frac{40}{12}$	$3\frac{1}{3}$	3	<p>B1 for <math>\frac{8}{3}</math> oe or <math>\frac{5}{4}</math> oe improper fraction  M1 (dep) for multiplying numerator and denominator of “<math>\frac{8}{3}</math>” and “<math>\frac{5}{4}</math>”  A1 for <math>\frac{10}{3}</math> or <math>3\frac{1}{3}</math> oe mixed number</p> <p><i>Alternative method</i>  B1 for 1.25 and 2.66(6...) or 2.67  M1 (dep) for correct method of multiplication  A1 for 3.<math>\dot{3}</math></p>
19			2	<p>M1 for a relevant pair of intersecting arcs  A1 for line drawn within guidelines, at least 3cm in length, accept broken line  [SC: B1 for line drawn within guidelines if M0]</p>
20	$\begin{array}{l} 4x + 2y = 8 \\ 4x - 10y = 20 \\ \hline 12y = -12 \\ y = -1 \\ 4x + 2(-1) = 8 \\ x = 2.5 \end{array}$	$\begin{array}{l} x = 2.5 \\ y = -1 \end{array}$	3	<p>M1 for correct process to eliminate either <math>x</math> or <math>y</math> (condone one arithmetical error)  M1 (dep) for substituting found value into either equation  A1 for <math>x = 2.5</math>, <math>y = -1</math></p> <p>[SC: B1 for <math>x = 2.5</math> or <math>y = -1</math> if M0]</p>

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No	Working	Answer	Mark	Notes
21	(i) (ii)	$(x - 5)(x + 3)$ $x = 5, x = -3$	3	M1 for $(x \pm 5)(x \pm 3)$ A1 cao B1ft for $x = 5$ and $x = -3$ M1 can be awarded for (i) in (ii) if $(x \pm 5)(x \pm 3)$ and A1 for $(x-5)(x+3)$ IF NOT contradicted by answer in (i)