



# Cambridge IGCSE®

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**CAMBRIDGE INTERNATIONAL MATHEMATICS**

**0607/04**

Paper 4 (Extended)

**For examination from 2020**

MARK SCHEME

Maximum Mark: 120

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**Specimen**

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This document has **10** pages. Blank pages are indicated.

**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

<p><b>GENERIC MARKING PRINCIPLE 1:</b></p> <p>Marks must be awarded in line with:</p> <ul style="list-style-type: none"> <li>• the specific content of the mark scheme or the generic level descriptors for the question</li> <li>• the specific skills defined in the mark scheme or in the generic level descriptors for the question</li> <li>• the standard of response required by a candidate as exemplified by the standardisation scripts.</li> </ul>
<p><b>GENERIC MARKING PRINCIPLE 2:</b></p> <p>Marks awarded are always <b>whole marks</b> (not half marks, or other fractions).</p>
<p><b>GENERIC MARKING PRINCIPLE 3:</b></p> <p>Marks must be awarded <b>positively</b>:</p> <ul style="list-style-type: none"> <li>• marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate</li> <li>• marks are awarded when candidates clearly demonstrate what they know and can do</li> <li>• marks are not deducted for errors</li> <li>• marks are not deducted for omissions</li> <li>• answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.</li> </ul>
<p><b>GENERIC MARKING PRINCIPLE 4:</b></p> <p>Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.</p>
<p><b>GENERIC MARKING PRINCIPLE 5:</b></p> <p>Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).</p>

**GENERIC MARKING PRINCIPLE 6:**

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

**MARK SCHEME NOTES**

The following notes are intended to aid interpretation of mark schemes in general, but individual mark schemes may include marks awarded for specific reasons outside the scope of these notes.

**Types of mark**

- M** Method marks, awarded for a valid method applied to the problem.
- A** Accuracy mark, given for a correct answer or intermediate step correctly obtained. For accuracy marks to be given, the associated Method mark must be earned or implied.
- B** Mark for a correct result or statement independent of Method marks.

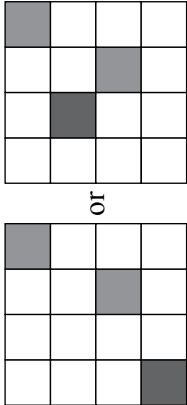
When a part of a question has two or more ‘method’ steps, the **M** marks are in principle independent unless the scheme specifically says otherwise; and similarly where there are several **B** marks allocated. The notation ‘dep’ is used to indicate that a particular **M** or **B** mark is dependent on an earlier mark in the scheme.

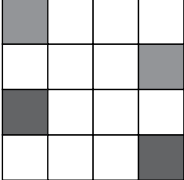
**Abbreviations**

<b>awrt</b>	answers which round to
<b>cao</b>	correct answer only
<b>cfs</b>	correct figures seen
<b>dep</b>	dependent
<b>FT</b>	follow through after error
<b>isw</b>	ignore subsequent working
<b>nfww</b>	not from wrong working
<b>oe</b>	or equivalent
<b>rot</b>	rounded or truncated
<b>SC</b>	special case
<b>soi</b>	seen or implied

Question	Answer	Marks	Partial Marks
1(a)	9.84 or 9.840 to 9.841	2	M1 for $\sin 41 = \frac{BD}{15}$ oe or better
1(b)	83.6 or 83.64 to 83.65	2	M1 for $0.5 \times 17 \times \text{their (a)}$ oe
1(c)	$17^2 + 15^2 - 2 \times 17 \times 15 \cos 41$ 129 or 129.0 to 129.1 11.4 or 11.36...	M1 A1 A1	
			If 0 scored <b>SC2</b> for 11.4 or 11.36...

Question	Answer	Marks	Partial Marks
2(a)	27.3 or 27.27...	3	M2 for $\frac{220-160}{220} \times 100$ oe or M1 for $\frac{220-160}{220}$ oe or $\frac{160}{220} \times 100$ oe
2(b)	240	3	M2 for $216 \div 0.9$ oe or M1 for $216 = 90\%$
2(c)(i)	1190 or 1186 or 1185. ...	3	M2 for $2180 \times 0.97^{20}$ oe or M1 for $2180 \times 0.97^k$ $k$ integer $> 1$ oe
2(c)(ii)	26	2	M1 for $2180 \times 0.97^n = 1000$ oe If 0 scored, <b>SC1</b> for answer 25

Question	Answer	Marks	Partial Marks
3(a)(i)		1	

Question	Answer	Marks	Partial Marks
3(a)(ii)		1	
3(b)(i)	7	2	M1 for $\frac{3}{2} = \frac{10.5}{RQ}$ oe or better
3(b)(ii)	20	2	M1 for $\left(\frac{3}{2}\right)^2$ or $\left(\frac{2}{3}\right)^2$ oe

Question	Answer	Marks	Partial Marks
4(a)(i)	$60 < v \leq 70$	1	
4(a)(ii)	65.9 or 65.93 to 65.94	2	M1 for at least 3 correct mid-values seen
4(a)(iii)	Correct curve drawn	3	B1 for 5 correct heights plotted or cfs B1 for points plotted at 60, 70, 75, 90
4(b)	$-0.286r + 35.4$ or $(-0.2861\dots)r + (35.38 \text{ to } 35.39)$	2	B1 for $(-0.286 \text{ or } -0.2861\dots)r + k$ or for $kr + (35.4 \text{ or } 35.38 \text{ to } 35.39)$ or SC1 for $-0.29r + 35$

Question	Answer	Marks	Partial Marks
5(a)(i)	Enlargement [factor] 0.5 oe [centre] (0, 8)	3	B1 for each
5(a)(ii)	Enlargement [factor] 2 and [centre] (0, 8)	2	FT <i>their</i> scale factor and centre B1 for each
5(b)(i)	Image at (4, 4), (8, 4), (8, 6)	2	M1 for $y = x$ drawn
5(b)(ii)	Image at (6, 8), (6, 6), (10, 6)	2	SC1 for 90° anti-clockwise but different centre

Question	Answer	Marks	Partial Marks
5(c)	Reflection, x-axis oe	3	M2 for full method seen i.e. diagram or unit vectors. or M1 for one of transformations correctly carried out If 0 scored, <b>SC1</b> for any reflection in answer

Question	Answer	Marks	Partial Marks
6(a)	6280 or 6283 to 6284	3	M2 for $\frac{2}{3} \times \pi \times 10^2 \times 30$ oe or M1 for $\left[\frac{1}{3}\right] \pi \times 10^2 \times 30(1000\pi)$
6(b)(i)	$\frac{1}{3} \times \pi \times 10^2 \times 30 - \frac{1}{3} \times \pi \times 5^2 \times 15$ oe	M3	Allow use of <i>their</i> volume of cone from (a) or $\frac{7}{8} \times \frac{1}{3} \times \pi \times 10^2 \times 30$ or $\frac{7}{8}$ <i>their</i> volume of cone from (a) M2 for $\frac{1}{3} \times \pi \times 5^2 \times 15$ oe or B1 for radius of small cone = 5
6(b)(ii)	2748.8 to 2749.3 1.96 or 1.963 to 1.964	A1 3	not 2749 alone B2 for 1960 or 1963 to 1964 or M1 for $\pi \times 10^2 \times 15 - 2749$ M1 for correctly converting <i>their</i> volume in cubic centimetres to litres

Question	Answer	Marks	Partial Marks
7(a)(i)	$x > -7$ oe	3	M2 for $2x - 5x < 15 + 6$ or better or B1 for $2x - 6$ or $5x + 15$
7(a)(ii)	Line with empty circle at $-7$ and arrow to right	1	Strict FT, must be from an inequality

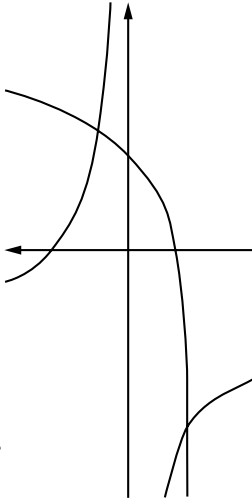
Question	Answer	Marks	Partial Marks
7(b)	Sketch of $y = (x + 3)^2 + (x + 1)^2 - 25$ oe or $2x^2 + 8x - 15 = 0$ -5.39 and 1.39	M2  B4	M1 for sketch of $(x + 3)^2 + (x + 1)^2$ or B1 for $x^2 + 3x + 9$ or $x^2 + x + 1$ oe  B3 for -5.391... and 1.391... or B2 for -5.39 or 1.39 or B1 for -5.391... or 1.391... or M1 for sketch of parabola or correct substitution in formula or reaching $2(x + 2)^2 - 23$ oe
7(c)(i)	Appropriate sketch which could lead to answer  4.36 or 4.360...	M2  B1	M1 for correct sketch of $\log x$ or other equation containing $\log x$
7(c)(ii)	4.36 or 4.360...  5.76 or 5.760...	B1  B1	FT their (c)(i)
7(d)	$\frac{x^2 - x + 2}{(x - 1)(x + 1)}$ oe final answer	3	B1 for $x(x + 1) - 2(x - 1)$ oe seen B1 for denominator $(x - 1)(x + 1)$ oe
Question	Answer	Marks	Partial Marks
8(a)	127	3	M1 for angle $ADB$ or $ABD = 0.5(180 - 124)$ implied by 28 in diagram M1 for angle $DBC = \text{angle } ADB$
8(b)	162	3	M2 for $(10 - 2) \times 180 - 9 \times 142$ or M1 for $(10 - 2) \times 180$
8(c)(i)	65	2	B1 for angle $ADB = 25$ or angle $ACD = 65$
8(c)(ii)	70	2	B1 for angle $BAC = 20$ or angle $FDC = 70$
8(c)(iii)	85	1	

Question	Answer	Marks	Partial Marks
9(a)	3.56 or 3.555 to 3.556	3	M2 for $\frac{10+6}{\frac{10}{4} + \frac{6}{3}}$ or M1 for $\frac{10}{4}$ or $\frac{6}{3}$
9(b)	$\frac{5x-4}{5}$ or $x - 0.8$ or $x - \frac{4}{5}$ or $0.2(5x - 4)$ final answer nfw	4	M3 for $\frac{x \times \frac{45}{60} + (x-2) \times \frac{30}{60}}{\frac{45}{60} + \frac{30}{60}}$ oe or M2 for $x \times \frac{45}{[60]} + (x-2) \times \frac{30}{[60]}$ oe or M1 for one of these products or evidence of total distance $\div$ total time

Question	Answer	Marks	Partial Marks
10(a)	$\frac{1}{3}$	1	
	$\frac{2}{5}$	1	
	$\frac{1}{10}$ and $\frac{9}{10}$	1	
10(b)	$\frac{2}{3} \times \frac{3}{5} + \frac{1}{3} \times \frac{1}{10}$	2	FT <i>their</i> (a) M1 for one correct pair of fractions multiplied
10(c)	$\frac{17}{30}$ and $\frac{12}{13}$	1	
	$\frac{8}{17}$ and $\frac{9}{17}$	2	M1 for $\frac{17}{30} \times x = \frac{9}{30}$ oe

Question	Answer	Marks	Partial Marks
11(a)	8	1	
11(b)	{2, 1}	1	



Question	Answer	Marks	Partial Marks
11(c)	-6 and 2	4	<b>B3</b> for $(x-6)(x+2)$ or <b>SC3</b> for 6 and -2 or <b>B2</b> for $x^2 - 2x - 2x + 4 - 16$ or better or <b>M1</b> for $(x-2)^2 - 16$ or for $x^2 + ax + bx + ab$
11(d)(i)	$\frac{2-x}{x}$ oe final answer	3	<b>M1</b> for interchanging $x$ and $y$ <b>M1</b> for a correct multiplication <b>M1</b> for a correct rearrangement and a correct division <b>If answer incorrect maximum possible is M2</b>
11(d)(ii)	$\log_2 x$ or $\frac{\log x}{\log 2}$	2	<b>M1</b> for $\log y = x \log 2$ or $\log_2 y = x$ oe or $x = 2^y$
11(e)	Stretch [factor] 2 and $x$ -axis invariant	2	<b>B1</b> for each
Question	Answer	Marks	Partial Marks
12(a)	Fully correct sketches 	2	<b>B1</b> for rectangular hyperbola with correct orientation but inaccurate <b>2</b> Correct curve crossing positive $x$ -axis and negative $y$ -axis <b>B1</b> for exponential curve with correct orientation but inaccurate
12(b)(i)	$x = -2$ $y = 0$	2	<b>B1</b> for each
12(b)(ii)	$y = -5$	1	
12(c)	$x > 2.9[0]$ or 2.897...	2	<b>B1</b> for 2.9[0] or 2.897... seen

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