



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education (9–1)

MATHEMATICS

0626/04

Paper 4 (Extended)

For Examination from 2017

SPECIMEN MARK SCHEME

1 hour 30 minutes

MAXIMUM MARK: 84

This syllabus is regulated in England as a Cambridge International Level 1/Level 2 (9–1) Certificate.

This document consists of **9** printed pages and **1** blank page.



Marking instructions

MARKING - GENERAL

1. Where a candidate has crossed out a complete part of a question, it should be marked provided that it has not been replaced.
2. If two or more methods are offered, mark the method that leads to the answer on the answer line.
3. Method marks are for a full correct method but may be lost if subsequent incorrect method is shown.
4. Unless a particular method has been specified in the question, full marks may be awarded for any correct method. However, if a calculation is required then no marks will be awarded for a scale drawing.
5. Where the answer in the answer space is incorrect because of a clear transcription error, then marks may be awarded.
6. Occasionally a candidate will misread a number in a question and use that value consistently throughout. Provided that number does not alter the difficulty or method required, award all marks earned and penalise 1 mark. **M** marks are still awarded in any case. Record this by using the **MR** annotation.
7. Unless specified in the question, answers may be given as fractions, decimals or in standard form. Ignore superfluous zeros provided that the degree of accuracy is not affected.
8. Allow any sensible notation. Watch out for commas being used for decimal points and dots being used for products. Brackets may be seen to represent inequalities.
9. Anything in the mark scheme which is in square brackets [...] is not required for the mark to be earned, but if present it must be correct.
10. FT – A correct answer will score or follow through after an error.
Strict FT – you must follow through from their error. These will be indicated in the mark scheme.

ABBREVIATIONS IN MARK SCHEME

Abbreviation	Meaning
M	Method marks – for a correct method applied to appropriate numbers
A	Accuracy marks – depend on M marks. Hence M0 A1 is not possible
B	Independent of method marks – for a correct final answer or intermediate stage
SC	Marks given in special cases only when indicated in mark scheme
FT	Work can be followed through after an error
isw	Ignore subsequent working (after correct answer obtained)
cao	Correct answer only
nfw	Not from wrong working
oe	Or equivalent
soi	Seen or implied
eeo	Each error or omission
dep	Dependent on the previous mark(s)

ACCURACY

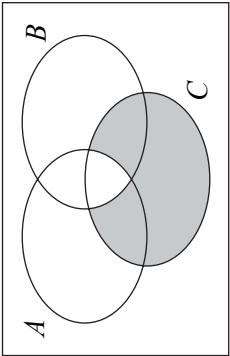
1. If a question asks for a particular level of accuracy then the mark scheme will include specific details.
2. In other cases, the following apply:
 - More than 3 sf in the answer but correct (either rounded or truncated to 4 or more figure accuracy) – allow full marks.
 - Less than 3 sf in the answer but correct to 3 or more sf seen in the working – allow full marks even if rounded incorrectly.
 - 3 sf incorrect in the answer but 3 or more correct seen in the working – allow full marks.
 - If the third sf is zero after the decimal point (e.g. 15.0) then allow marks for 2 sf answers providing no wrong working is seen.
3. General principles are:
 - 2 sf answers will not imply method in most cases.
 - If the final answer on the answer line has clearly been spoiled from the 3 sf or more answer seen in the working (more than just rounding errors) don't allow the marks.
 - Mark at most accurate which is usually where the answer is first seen.
 - If the most accurate answer is incorrect then it scores zero, even if it has been correctly rounded into a correct answer.
 - If this answer is then used in another part of the question then any **M** marks are available.
 - If an accuracy FT is also available in the new part, then give the FT mark for a correct follow through from a value which has lost the accuracy mark in the first part.
 - However, a correct value from the first part may have been given the accuracy mark but has then been rounded incorrectly and this has been condoned. If the wrongly rounded value is used in the new part and leads to an incorrect answer, even if correctly followed through, then this should not receive the accuracy mark here and should not be treated as a FT case.

4. **Exact answers involving π and $\sqrt{\quad}$**

- Exact answer 2.345π Unless question is set in context (where some appreciation of appropriate accuracy is required), allow **A1** for 2.345π on the answer line, allow **A0** for 2.35π .
Mark scheme will indicate in final column if marks to be allowed.
- Exact answer $\sqrt{23}$ Scores **A1** if the question is not set in context and the $\sqrt{\text{(prime number)}}$ is given on the answer line.
Scores **A0** if the question is set in context (where some appreciation of appropriate accuracy is required).
Surd answers which simplify need not be implied e.g. $\sqrt{12}$ or $2\sqrt{3}$ are acceptable but not irrational denominators – if simplified, mark the simplified answer i.e. not isw.
Mark scheme will indicate in final column if marks to be allowed.

Qu.		Answers	Mark	Part Marks	Notes
1	(a)	2.3×10^5	1		
	(b)	[0],00048	1		
2	(a)	4 nfw	3	M1 for correct first step i.e. $20x - 8 = 18x$ or $5x - 2 = 4.5x$ M1 for collecting xs correctly from <i>their</i> first step	Allow embedded answer on answer line
	(b)	-3 and 1	3	M2 for $(x+3)(x-1) [=0]$ or M1 for $(x+a)(x+b)$ where a and b are integers and $a+b=2$ or $ab=-3$	One correct answer implies M1
3		$6b(a-4c)$	2	M1 for $6(ab-4bc)$ or $b(6a-24c)$ or $2b(3a-12c)$ or $3b(2a-8c)$	
4		$360 \div 50$ is not an integer oe	2	M1 for $360 \div (180-130)$	
5	(a)	$\frac{4}{5}$ correctly placed $\frac{1}{2}$ and $\frac{1}{3}$ and $\frac{2}{3}$ correctly placed	1 1		
	(b)	$\frac{19}{30}$	3	M2 for $\left(\frac{1}{5} \times \text{their } \frac{1}{2}\right) + \left(\text{their } \frac{4}{5} \times \text{their } \frac{2}{3}\right)$ or better or M1 for one of these products	May be seen on diagram
6	(a)	2 correct medians or ranges Correct comparison made	2 1dep	B1 for each dependent on identifying 2 ranges or 2 medians If 0 scored, SC1 for completely correct comparison using average and range correctly but no values given	Range A(50) and B(33) Median A(154) and B(157) e.g. School A has a greater range than School B e.g. Students in A are shorter on average than those in B but the heights are less consistent
	(b)	Correct comment mentioning gender Correct comment about sample size	1 1		e.g. Sample could be of boys & girls e.g. Sample size too small

Qu.		Answers	Mark	Part Marks	Notes
7		Perpendicular bisector with two correct pairs of arcs	M2	B1 for correct line with no/wrong arcs	Tolerance ± 2 mm
		Arc centre C , radius 7 cm	M1		Tolerance ± 2 mm
		Correct region shaded	A1		
8		90005 should not have been rounded to 100000 oe	1	e.g. 90005 rounds to 90 000	
		$\sqrt{1\ 600\ 000}$ is not 4000 oe	1	e.g. $\sqrt{1\ 440\ 000} = 1200$	
9	(a)	40	2	M1 for $\frac{144 \times 1000}{60 \times 60}$ oe	
	(b)	3.5	2FT	FT 140 $\div$ <i>their</i> (a) M1 for dist $\div$ <i>their</i> (a) or dist $\div$ 40 or dist $\times \frac{60 \times 60}{144 \times 1000}$ or B1 for 140 seen	
10		$y < 8$	1		
		$y \geq 6 - x$ oe and $y \geq x + 2$ oe	3	B2 for either $y \geq 6 - x$ oe or $y \geq x + 2$ oe or SC2 for $y = 6 - x$ oe and $y = x + 2$ oe or SC1 for $y > 6 - x$ or $y = 6 - x$ or $y > x + 2$ or $y = x + 2$	
11	(a)	$\frac{8}{25}$ oe	2	B1 for 8 or $\frac{1}{25}$	
	(b)	$\frac{3}{2}$ oe	2	B1 for $(\frac{2}{3})^{-1}$ or $(\frac{27}{8})^{\frac{1}{3}}$	
12	(a)	rotation, 180° , [centre] (7, 6)	3	B1 each (independent)	Accept enlargement [factor] -1 centre (7, 6)
	(b)	enlargement, [factor] $\frac{1}{3}$, centre (0, 0)	3	B1 each (independent)	

Qu.		Answers	Mark	Part Marks	Notes
13		Median is greater for Electro company so Tom is wrong because Spark is cheaper oe	2	M1 for Spark median = 46 and Electro median = 52	
		IQR is greater for Spark company so Tom is right Spark is more varied oe	2	M1 for Spark IQR = 26 and Electro IQR = 18	
14			1		
15	(a)	64	2	B1 for $[f(1) =] 4$ or M1 for $((x - 3)^2)^3$ or better	
	(b)	$4x + 1$ oe	2	M1 for $x = \frac{y-1}{4}$ or $4y = x - 1$	
	(c)	$\frac{x^3 - 1}{4}$ oe final answer	1		
16		9	3	M1 for $y = \frac{k}{\sqrt{x}}$ oe A1 for $k = 54$ oe or better [$k = 54$ implies M1A1]	
17	(a)	7	1		
	(b)	$\begin{pmatrix} 33 & 16 \\ 32 & 17 \end{pmatrix}$	2	B1 for one column or row correct	
18		$\frac{1}{8}$ oe nfww	3	M2 for $8x = 1$ or $8x - 1 = 0$ or M1 for $1 - 2(3x) [= 2x]$	

Qu.		Answers	Mark	Part Marks	Notes
19		$[c =] 6$	2	M1 for $\frac{30}{360} \times \pi \times 6^2 [\times 2]$	Accept 6π
		$[d =] 9$	3	M2 for $\frac{1}{2} \times 6^2 \times \frac{\sqrt{3}}{2}$ or B1 for $\sin 120 = \frac{\sqrt{3}}{2}$ or M1 for $\frac{1}{2} \times 6^2 \times \sin 120$	Accept $9\sqrt{3}$
20	(a)	$\sqrt{2}$	1		
	(b)	$8 + 4\sqrt{2}$	3	M2 for $\frac{8(2+\sqrt{2})}{4-2}$ or M1 for $\frac{8(2+\sqrt{2})}{(2-\sqrt{2})(2+\sqrt{2})}$	
21	(a)	$\frac{3x}{x-5}$	3	B1 for $3x(5+x)$ B1 for $(x+5)(x-5)$	
	(b)	$\frac{3(t-1)}{t-1} - \frac{t+2}{t-1}$ $\frac{3t-3-t-2}{t-1}$ $= \frac{2t-5}{t-1}$	M1 A1	Implies M1 With brackets expanded and no errors shown	

Qu.		Answers	Mark	Part Marks	Notes
22		$\sqrt{(5x)^2 + (12x)^2}$	M1		
		[slant height =] 13x	A1		
		$\pi(5x)^2$ or $\pi(5x)(13x)$	M1		
		$\pi(5x)^2 + \pi(5x)(13x) = 4\pi r^2$	M1		
		$r^2 = \frac{90\pi}{4\pi} x^2 = \frac{45}{2} x^2$	A1	With all steps shown and no errors seen	Accept $25\pi x^2$

