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Cambridge Assessment International Education

Cambridge IGCSE®

MATHEMATICS **0580/02**

Paper 2 (Extended) **For examination from 2020**

MARK SCHEME

Maximum Mark: 70

Specimen

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

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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.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- 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
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- 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.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

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).

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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 mark, 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

cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
nfww	not from wrong working
oe	or equivalent
SC	special case
soi	seen or implied

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Question	Answer	Marks	Partial Marks
1	8(h) 52 (min)	**1**	

Question	Answer	Marks	Partial Marks
2	3.75 or $3\frac{3}{4}$	**1**	

Question	Answer	Marks	Partial Marks
3	$\frac{1}{3}$	**1**	

Question	Answer	Marks	Partial Marks
4	Identifies error correctly (Refers to $100\,mm^2 = 1\,cm^2$ oe)	**1**	

Question	Answer	Marks	Partial Marks
5	11	**2**	**M1** for $-2 \times -7 - 3$ soi

Question	Answer	Marks	Partial Marks
6	10 | 7 11 | 4 6 8 12 | 0 4 7 9 13 | 0 2	**2**	**B1** for 8 or 9 correct numbers ordered or for 10 correct numbers not ordered

Question	Answer	Marks	Partial Marks
7	Triangle drawn accurately with a ruler and a pair of arcs	**2**	**B1** for two sides of the correct length drawn as part of a triangle

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Question	Answer	Marks	Partial Marks
8	(a =) 70 (b =) 40	**2**	**B1** for each

Question	Answer	Marks	Partial Marks
9	$w = \frac{3y-7}{5}$ oe	**2**	**M1** for $5w + 7 = 3y$ or $5w - 3y = -7$ or $5w = 3y - 7$ or $w - \frac{3y}{5} + \frac{7}{5} = 0$

Question	Answer	Marks	Partial Marks
10	Cannot be written as a fraction oe	**1**	Accept 3 is a prime number Accept decimal going on forever with no pattern oe

Question	Answer	Marks	Partial Marks
11	428.5	**1**	First value
	429.5	**1**	Second value

Question	Answer	Marks	Partial Marks
12	9.1 oe	**2**	**M1** for $\frac{5.2}{PQ} = \frac{12.4}{21.7}$ oe

Question	Answer	Marks	Partial Marks
13	$n > 3.75$	**2**	**M1** for $7 + 8 < 5n - n$ oe allow 3¾

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Question	Answer	Marks	Partial Marks
14	Common denominator 60	**B1**	Accept $k \times 60$
	$\frac{35 \text{ (or } 95)}{60} + \frac{39}{60}$	**M1**	Accept $\frac{35k \text{ (or } 95k)}{60k} + \frac{39k}{60k}$
	$\frac{134}{60}$ or $1\frac{74}{60}$ or $2\frac{14}{60}$ **and** $2\frac{7}{30}$	**A1**	Accept $\frac{134k}{60k}$ or $1\frac{74k}{60k}$ or $2\frac{14k}{60k}$ **and** $2\frac{7}{30}$

Question	Answer	Marks	Partial Marks
15(a)	–3	**1**	
15(b)	$9 - 2n$ oe	**2**	**B1** for $-2n + k$ or $dn + 9$ where $d \neq 0$

Question	Answer	Marks	Partial Marks
16	145	**3**	**M2** for $(6 - 2) \times 180 - 5 \times 115$ oe or **M1** for $(6 - 2) \times 180$ oe Alternative method **M2** for $180 - (360 - 5 \times (180 - 115))$ or **M1** for $360 - 5 \times (180 - 115)$

Question	Answer	Marks	Partial Marks
17	69.3 or 69.28...	**4**	**M2** for height $\sqrt{8^2 - 4^2}$ oe or **M1** for $4^2 + h^2 = 8^2$ oe **and M1** for $\frac{1}{2}(8 + 12) \times$ *their* perp height oe

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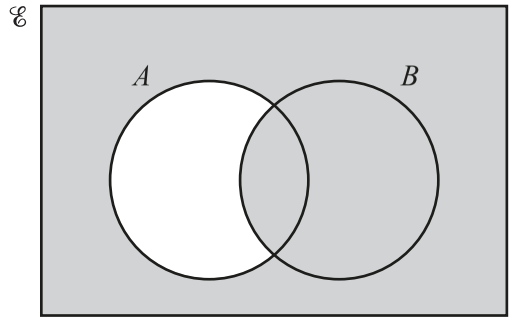
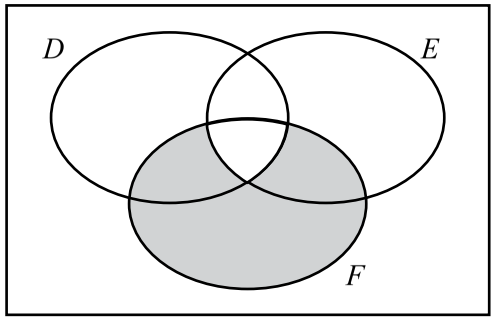
Question	Answer	Marks	Partial Marks
18(a)		**1**	
18(b)		**1**	

Question	Answer	Marks	Partial Marks
19	1.37 or 1.374…	**1**	

Question	Answer	Marks	Partial Marks
20	$100x = 32.22\ldots$ oe	**M1**	
	$\frac{29}{90}$ oe fraction	**B1**	

Question	Answer	Marks	Partial Marks
21	A C D	**3**	**B1** for each

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Question	Answer	Marks	Partial Marks
22	$\frac{10}{12}$ oe	**3**	**M2** for $1-\frac{2}{3}\times\frac{1}{4}$ or for $\frac{1}{3}\times\frac{3}{4}+\frac{1}{3}\times\frac{1}{4}+\frac{2}{3}\times\frac{3}{4}$ or **M1** for $\frac{2}{3}\times\frac{1}{4}$ or for $\frac{1}{3}\times\frac{1}{4}+\frac{2}{3}\times\frac{3}{4}$

Question	Answer	Marks	Partial Marks
23	27	**3**	**M2** for $\frac{6\pi}{2\times\pi\times9}\times\pi\times9^2$ oe or **M1** for $\frac{6\pi}{2\times\pi\times9}$ oe

Question	Answer	Marks	Partial Marks
24	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

Question	Answer	Marks	Partial Marks
25	$(x+2)^2$ or $x^2+2ax+a^2-b$	**M1**	
	$-3-(\textit{their}\ 2)^2$ or $a^2-b=-3$ or $2a=4$	**M1**	
	$(x+2)^2-7$ or $a=2$ and $b=7$	**M1**	
	$(-2, -7)$	**B1**	

Question	Answer	Marks	Partial Marks
26(a)	55	**1**	
	Alternate segment	**1**	
26(b)	115	**1**	
	Cyclic quadrilateral	**1**	

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Question	Answer	Marks	Partial Marks
27(a)	$3x^2$	**2**	**B1** for $3x^k$ or kx^2 ($k \neq 0$)
27(b)	32	**3**	**M2** for $8x^2$ and $\frac{4}{x^2}$ or **B1** for $8x^2$ or $\frac{4}{x^2}$

Question	Answer	Marks	Partial Marks
28	$5x^2 + 4x – 19 = 4x + 1$	**M1**	For subtracting the two equations
	$5x^2 – 20 = 0$	**M1**	Alternative method $5x^2 = 20$
	[5] $(x – 2)(x + 2)$ [= 0]	**M1**	$x^2 = 4$
	$x = 2$ and –2	**B1**	
	$y = 9$ and –7	**B1**	

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