



Mark Scheme (Results)

November 2020

Pearson Edexcel International GCSE
Mathematics A (4MA1)
Paper 2FR

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

November 2020

Publications Code 4MA1_2FR_2011_MS

All the material in this publication is copyright

© Pearson Education Ltd 2021

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.

Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

- **Types of mark**

- M marks: method marks
- A marks: accuracy marks
- B marks: unconditional accuracy marks (independent of M marks)

- **Abbreviations**

- cao – correct answer only
- ft – follow through
- isw – ignore subsequent working
- SC - special case
- oe – or equivalent (and appropriate)
- dep – dependent
- indep – independent
- awrt – answer which rounds to
- eoo – each error or omission

- **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.

- **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.

If a candidate misreads a number from the question. Eg. Uses 252 instead of 255; method marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review. If there is a choice of methods shown, mark the method that leads to the answer on the answer line; where no answer is given on the answer line, award the lowest mark from the methods shown.

If there is no answer on the answer line then check the working for an obvious answer.

- **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.

- **Parts of questions**

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded to another.

International GCSE Maths

Apart from questions 11, 15, 19 and 22b the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Q	Working	Answer	Mark	Notes
1 (a)		Tonga	1	B1 cao
(b)		5 hundred(s)	1	B1 for 5 hundred(s) or 500
(c)		four thousand, four hundred and thirty seven	1	B1 all numbers must be as words
(d)		8458	1	B1 cao
(e)	8047 + 2864		2	M1 for 'any value from table' + 2864
		10 911		A1 cao
				Total 6 marks

2 (a)		sphere	1	B1
(b)		12	1	B1 cao
(c)		10	1	B1 cao
				Total 3 marks

3	(a)		243	1	B1	cao
	(b)		Multiplying previous term by 3	1	B1	for multiplying previous term by 3 oe "×3" or 81×3
	(c)		19 683	1	B1	cao
						Total 3 marks

4	(a)		2.7	1	B1	condone 2.7 million
	(b)		Malaysia	1	B1	cao
	(c)		Correct bar drawn	1	B1	for correct bar at a height of 5.4 (within half small square) allow any bar width or location (no gap required) condone stick at correct height.
	(d)		Russia	1	B1	cao
						Total 4 marks

5	(a)		3.0 – 3.2	1	B1	for in the range 3.0 – 3.2
	(b)		Parallelogram	1	B1	allow trapezium
	(c)		2	1	B1	cao
	(d)		Correctly labelled	1	B1	Angle <i>DAB</i> or angle <i>DCB</i> or both labelled
	(e)	$\frac{1}{2}(6+10) \times 4$		2	M1	for correct application of formula allow triangle method
			32		A1	cao
						Total 6 marks

6	$5 \times 25 (= 125)$		4	M1 total number of balloons
	'125' \div 32 (= 3.9....)			M1
	'125' $- (32 \times 3)$ or $125 - 96$ or $3\frac{29}{32}$			M1
		29		A1
				Total 4 marks

Alternative Mark Scheme for Q6				
6	$5 \times 25 (= 125)$		4	M1
	$32 \times 3 (= 96)$ or $32 \times 4 (= 128)$			M1
	'125' $- (32 \times 3)$ or '125' $- 96$			M1
		29		A1
				Total 4 marks

7	$180^\circ - (104^\circ + 42^\circ) (= 34^\circ)$ or $\frac{180^\circ - '34^\circ'}{2}$		4	M1 for one correct stage
		73		A1 for 73
	<ul style="list-style-type: none"> • <u>Angles</u> in a <u>triangle</u> sum to 180° or (angles in a <u>triangle</u> sum to 180°) • Angle BDC and angle DBA are <u>alternate</u> angles • Base angles in an <u>isosceles</u> triangle are equal or (<u>Allied / co-interior</u> angles add up to 180°)	correct reasons		B2 dep fully correct method. for all correct reasons for the method used NB allied angles may not be needed if using ABD sum to 180° (B1 dep M1 for one correct reason)
				Total 4 marks

8	(a)	$20 + 45$ or $20 + 9 \times 5$		2	M1
			65		A1
	(b)	$164 - 20 (= 144)$		3	M1
		'144' $\div 9 (= 16)$			M1
			16		A1 cao
	(c)			2	M1 for $T = an + 20$ or $T = 9n + k$ or $9n + 20$
			$T = 9n + 20$		A1 for $T = 20 + 9n$ or $T = 9n + 20$
					Total 7 marks

9	(a)		28	1	B1 cao
	(b)		18	1	B1 cao
	(c)		0.85	1	B1 cao
	(d)	$\frac{45}{60}, \frac{24}{60}, \frac{28}{60}, \frac{40}{60}$ or 0.75, 0.4, 0.466..., 0.666... or 75%, 40%, 46.6%, 66.6%		2	M1 for a method to compare the fractions If M0, award B1 for any three of these fractions in the correct order or for all fractions (or dec or perc) in correct reverse order
			$\frac{2}{5}, \frac{7}{15}, \frac{2}{3}, \frac{3}{4}$		A1 allow answers in any form (dec or perc)
	(e)	$\frac{36}{96}$ oe		2	M1 for fraction or for partial simplification.
			$\frac{3}{8}$		A1 cao correct answer scores full marks
					Total 7 marks

10	$72 \div 3 (= 24)$ or $\frac{x}{68} = \frac{72}{3}$		4	M1
	'24' $\times 68 (= 1632)$ or $(x =) \frac{72}{3} \times 68$ oe			M1
	'1632' $\div 60 (= 27.2)$ or $30 \times 60 (= 1800)$ or '1632' $\div 3600 (= \frac{34}{75} = 0.453(333\dots))$			M1
		Yes with correct figures		A1 Yes and 27.2 or (1632 and 1800) seen or Yes and 0.453 oe seen
				Total 4 marks

Alternative Mark Scheme for Q10 (calculation in minutes)				
10	$72 \div 60 (= 1.2)$		4	M1
	'1.2' $\div 3 (= 0.4)$			M1
	$68 \times '0.4' (= 27.2)$			M1
		Yes, with correct figures		A1 Yes and 27.2 seen
				Total 4 marks

11	$\frac{10}{24} + \frac{9}{24}$ or $\frac{10n}{24n} + \frac{9n}{24n}$ or eg $\frac{40+36}{96} \left(= \frac{76}{96} \right)$		2	M1 for writing a sum, and each fraction with a common denominator, eg $\frac{10}{24} + \frac{9}{24}$
	$\frac{10}{24} + \frac{9}{24} = \frac{19}{24}$ or eg $\frac{40+36}{96} = \frac{76}{96} = \frac{19}{24}$	clearly shown		A1 dep on M1 continued to clearly show given result
				Total 2 marks

12 (a)		$4m + 8$	1	B1 do not isw further incorrect working
(b)	$2x = -19 - 5$ or $2x = -24$ or $x = \frac{-19-5}{2}$ or $x = \frac{-24}{2}$		2	M1
		-12		A1 cao
				Total 3 marks

13 (a)		Correct mirror line $x = -1.5$	1	B1 Correct line drawn at $x = -1.5$ allow freehand with intention to draw at -1.5
(b)		Shape drawn	2	B2 for correct shape with vertices at $(-1,2)$, $(-1, 4)$, $(-3, 2)$ and $(-3, 5)$ (B1 for a correct orientation or 90° clockwise turn about correct point)
				Total 3 marks

14	(a)	Spinner B					Correct values	2	B2 for all 9 correct values (B1 5 or 6 or 7 or 8 correct values)	
		Spinner A		1	2	3				4
			1	(2)	(3)	4				5
			2	(3)	4	5				6
3	4	5	6	7						
	(b)						2	M1 for $\frac{6}{m}$ where $m > 6$ or $\frac{n}{12}$ where $n < 12$		
						$\frac{6}{12}$		A1ft "6" $\frac{6}{12}$ oe ft their table. isw incorrect cancelling.		
	(c)	$\frac{3}{12} \times 84$					2	M1 allow "a fraction" $\times 84$ fraction cannot be zero or improper		
						21		A1 cao		
								Total 6 marks		

15				3	M1 for continual prime factorisation (at least two consecutive steps correct) or at least two stages of a factor tree, or table, correct.
					M1 for a fully correct factor tree or a list (2,2,2,2,5,11) or $2 \times 2 \times 2 \times 2 \times 5 \times 11$
			$2^4 \times 5 \times 11$		A1 dep M2 for $2^4 \times 5 \times 11$ (with working seen)
					Total 3 marks

16	(a)		2 460 000	1	B1	accept 2,460,000 or 246 0000
	(b)		7.4×10^{-4}	1	B1	
	(c)			2	M1	for correct value not in standard form e.g. 58.3×10^5 or 583×10^4 or 0.583×10^7 oe
			5 830 000		A1	5 830 000 or 5.83×10^6 do not isw.
						Total 4 marks

17				3	M1	for one of - 5 numbers with a median of 8 - 5 numbers with a mode of 5 - 5 numbers with a range of 10 - 5 numbers with a sum of 45
					M1	for two of - 5 numbers with a median of 8 - 5 numbers with a mode of 5 - 5 numbers with a range of 10 - 5 numbers with a sum of 45
			5, 5, 8, 12, 15		A1	Note: The numbers can be in any order
						Total 3 marks

18	(a)		33.75	1	B1 oe eg 33.750
	(b)		33.85	1	B1 allow 33.849 or 33.849 ^r or "33.8499..." do NOT allow 33.879 without indication of recurring "9"
					Total 2 marks

19		$\frac{70 \times 40}{0.02}$ or $\frac{68 \times 40}{0.02}$ or $\frac{70 \times 43}{0.02}$ or $\frac{68 \times 43}{0.02}$		2	M1 for a correct expression using a suitable approximation. 0.02 is the only acceptable denominator.
		$\frac{70 \times 40}{0.02} = 140\,000$ or $\frac{68 \times 40}{0.02} = \frac{2720}{0.02} = 136\,000$ or $\frac{70 \times 43}{0.02} = \frac{3010}{0.02} = 150\,500$ or $\frac{68 \times 43}{0.02} = \frac{2924}{0.02} = 146\,200$	Correct figures		A1 If student says 'no' then do not award the A mark Intermediate step required unless rounded to 1sf
					Total 2 marks

20	$4.3^2 + 6.4^2$ or 59.45		4	M1	for squaring and adding
	$\sqrt{4.3^2 + 6.4^2}$ or $\sqrt{59.45}$ or 7.71(038...) or 7.7			M1	dep 1st M1 for square rooting
	e.g ('7.71' + 4.3 + 6.4) × 22 or '18.4' × 22 or ('8' + 4.3 + 6.4) × 22 or '18.7' × 22 or '19' × 22 or '20' × 22			M1	dep 2nd M1 for a non-rounded perimeter × 22 or 18 × 22 or 19 × 22 accept 20 × 22
		\$418		A1	answer must come from 19
					Total 4 marks

21	$15 \times 24 (= 360)$ or $25 \times 18 (= 450)$		3	M1	may be implied by 810 seen
	$\frac{'360'+ '450'}{40} (= \frac{810}{40})$			M1	dep on M1
		20.25 oe		A1	for 20.25 accept 20.3 (allow 20 from correct working)
					Total 3 marks

22	(a)			2	M1 for $(x \pm 6)(x \pm 7)$
			$(x + 6)(x - 7)$		A1 for $(x + 6)(x - 7)$ or $(x - 7)(x + 6)$ isw roots given if candidate solves the quadratic = 0
	(b)	$3x - 8x < 3 - 15$ or $15 - 3 < 8x - 3x$		3	M1 accept as equation or with the wrong inequality sign.
		$-5x < -12$ or $12 < 5x$			M1 accept as equation or with the wrong inequality sign.
			$x > 2.4$		A1 Accept $2.4 < x$ or $x > \frac{12}{5}$ oe allow $(-\infty, 2.4)$ award M1 M1 A0 for 2.4 with = sign or no inequality or incorrect inequality sign.
					Total 5 marks

23	(a)		0	1	B1 condone 150^0
	(b)		-2	1	B1 condone 3^{-2}
					Total 2 marks

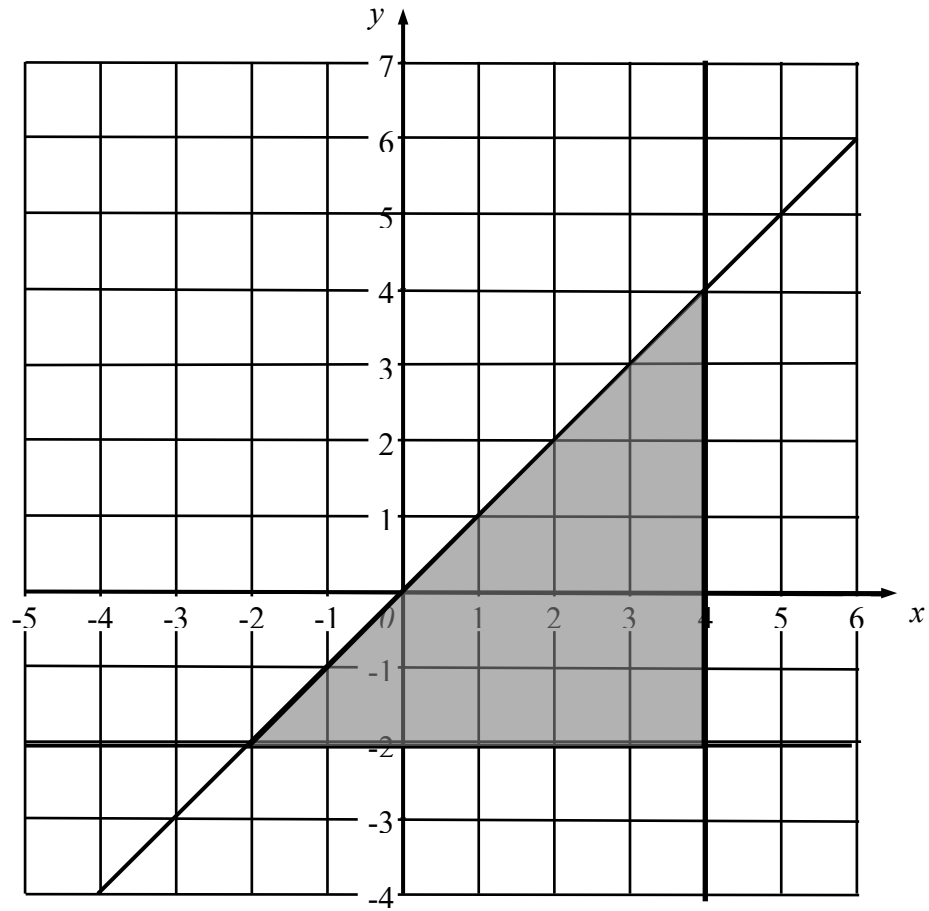
24	See appendix 1			3	M1 for $y = x$ correctly drawn
					M1 for $x = 4$ and $y = -2$ correctly drawn
			Correct region identified		A1 for correct region identified region may be shaded or left unshaded Condone missing label if region is clear and no contradictory labels
					Total 3 marks

25	$y = \frac{7-5x}{2}$ or $y = \frac{7}{2} - \frac{5}{2}x$ or $y = 3.5 - 2.5x$ or $2y = 7 - 5x$ oe		2	M1 for making y or $2y$ the subject
		-2.5		A1 for $-\frac{5}{2}$ or -2.5
				Total 2 marks

26	$\cos 35^\circ = \frac{15}{AB}$ or $\sin 55^\circ = \frac{15}{AB}$		5	M1
	$(AB =) \frac{15}{\cos 35^\circ}$ (=18.3) or $(AB =) \frac{15}{\sin 55^\circ}$ (=18.3)			M1 NB 18.3(116...)
	'18.3' \times 4 (= 73.2)			M1 dep 1st M1
	80 - '18.3' \times 4 or 80 - '73.2'			M1
		6.75		A1 accept 6.75 – 6.8
				Total 5 marks

Alternative Mark Scheme for Q26 [do not mix and match with above MS]				
26	15×4 (= 60)		5	M1
	$\cos 35^\circ = \frac{'60'}{AE}$ or $\sin 55^\circ = \frac{'60'}{AE}$			M1
	$(AE =) \frac{'60'}{\cos 35^\circ}$ (= 73.2) or $(AE =) \frac{'60'}{\sin 55^\circ}$ (= 73.2)			M1 dep 1st M1
	80 - '73.2'			M1
		6.75		A1 accept 6.75 – 6.8
				Total 5 marks

Appendix 1



Pearson Education Limited. Registered company number 872828
with its registered office at 80 Strand, London, WC2R 0RL, United Kingdom