

Mark Scheme

November 2020 (Results)

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 3F

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 1MA1_3F_2011_MS

All the material in this publication is copyright

© Pearson Education Ltd 2020

General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

- 1** All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.
Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

- 2** All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no 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.

Questions where working is not required: In general, the correct answer should be given full marks.

Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

- 3** **Crossed out work**
This should be marked **unless** the candidate has replaced it with an alternative response.

- 4** **Choice of method**
If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.
If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

- 5** **Incorrect method**
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 for your Team Leader to check.

- 6** **Follow through marks**
Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, 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.

7 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 or its context. (eg an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8 Probability

Probability answers must be given as a fraction, percentage or decimal. 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 fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9 Linear equations

Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified 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 (embedded answers).

10 Range of answers

Unless otherwise stated, when an answer is given as a range (eg 3.5 – 4.2) then this is inclusive of the end points (eg 3.5, 4.2) and all numbers within the range

11 Number in brackets after a calculation

Where there is a number in brackets after a calculation eg $2 \times 6 (=12)$ then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12 Use of inverted commas

Some numbers in the mark scheme will appear inside inverted commas eg “12” $\times 50$; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

13 Word in square brackets

Where a word is used in square brackets eg [area] $\times 1.5$: the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14 Misread

If a candidate misreads a number from the question. eg uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

Guidance on the use of abbreviations within this mark scheme

M	method mark awarded for a correct method or partial method
P	process mark awarded for a correct process as part of a problem solving question
A	accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)
C	communication mark awarded for a fully correct statement(s) with no contradiction or ambiguity
B	unconditional accuracy mark (no method needed)
oe	or equivalent
cao	correct answer only
ft	follow through (when appropriate as per mark scheme)
sc	special case
dep	dependent (on a previous mark)
indep	independent
awrt	answer which rounds to
isw	ignore subsequent working

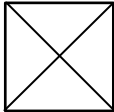
Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	3	B1	cao	
2	8	B1	cao	
3	$\frac{40}{100}$	B1	for $\frac{40}{100}$ or any equivalent fraction	
4	6.25	B1	for 6.25 oe	
5	-6,-4,-3, 0,1, 2,7	B1	for -6, -4, -3, 0, 1, 2, 7	accept reverse order
6 (a)	5	B1	cao	
(b)	5, 6	B1	cao	
7	$\frac{3}{4}$	M1 A1	for method to find fraction shaded, eg 12 out of 16 squares shaded or unsimplified answer eg $\frac{12}{16}$ or for $1 - \frac{1}{4}$ oe or for an answer of $\frac{1}{4}$ cao	May be expressed in a wide variety of ways.
8	78	P1 P1 A1	for process to find the number of boxes, eg $200 \div 25 (=8)$ or to find the cost of each tile, eg $9.75 \div 25 (=0.39)$ for complete process, eg “8” $\times$ 9.75, “0.39” $\times$ 200 cao	Could work in £ or in pence for P marks

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
9 (a)	30	B1	cao	
(b)	42	B1	cao	
(c)	$\frac{1}{20}$	B1	for $\frac{1}{20}$ or any equivalent fraction or 0.05	
10 (a)	80	B1	cao	“Yes” may be implied from wording Ignore any references to actual readings from the graph
(b)	8	B1	cao	
(c)	Yes and reason	C1	for yes and reason Acceptable examples Yes, because 27 is greater than 7 Yes, because the drop is 20 more Yes, the gradient is steeper (in the first 3 mins) and is then less steep (in the last 3 mins) Yes, because the drop is 20 less in the last 3 mins Yes, because the drop is more Not acceptable examples No Yes, because the drop is 20 less	
11	110	M1	for use of angles in a quadrilateral add to 360°, eg 360 – 130 – 95 – 65 (= 70)	May be seen in diagram or as a sum to 360°. (130 + 95 + 65) – 180 gains M2
		M1	for 180 – “70” or for (130 + 95 + 65) – 180	
		A1	cao	

Paper: 1MA1/3F					
Question		Answer	Mark	Mark scheme	Additional guidance
12	(a)(i)	20, 15	B1	cao	Working may be seen near the sequence
	(ii)	11	B1	cao	Working may be seen near the sequence
	(b)	39	B1	cao	
13		34	M1	for start to method, eg $10 - 4 (= 6)$ or $7 - 5 (= 2)$ or $10 + 7 + 4 + 5 (= 26)$ or $(10 + 7) \times 2$	6, 2 may be seen on diagram
			A1	cao	
14	(a)	$5x + y$	M1	for method to collect terms, eg $5x$ or y	May be seen in working. Accept if no ambiguity. Accept $1y$. Must be carried out, not just intention. Division by 5 must be all terms.
	(b)	3	A1	cao	
			M1	for subtracting 7 from both sides or dividing each term by 5 as a first step, eg $5p$ $= 15$ or $5p = 22 - 7$ or $\frac{5p}{5} + \frac{7}{5} = \frac{22}{5}$	
			A1	cao	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
15 (a)	shop A from correct figures	P1	for start of process to find the number of packs needed from at least one shop, eg $30 \div 4 (= 7.5 \text{ or } 8)$ or $30 \div 6 (= 5)$	
		P1	for process to find cost of batteries from at least one shop, eg $(30 \div 4) \times 1.6 (= 12.8 \text{ or } 12)$ or $(30 \div 6) \times 2.7 (= 13.5)$	
		P1	for a complete process to find the cost of batteries from both shops using whole packs eg “8” $\times 1.6 (= 12.8)$ and “5” $\times 2.7 (= 13.5)$	
		C1	for shop A with both 12.8(0) and 13.5(0)	
	(b) No effect (supported)	C1	(ft) for “has no effect” with reason Acceptable examples No, since A is 12 and B is 13.5(0) No, since A is just 80(p) less and B is the same. No, since A is less and B has not changed. No, since A is 1.5(0) less No, since 40(p) is less than 45(p) No, as batteries in B are 5p more Not acceptable examples Yes There is no change (unsupported) No, since A is less (incomplete)	
				“8” must come from “7.5” rounded up If figures are given as part of the answer they must be correct

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)	$\frac{5}{11}$	M1	for $\frac{5}{n}$ where $n > 5$ or $\frac{m}{11}$ where $m < 11$	where “11” comes from 5+2+4
		A1	for $\frac{5}{11}$ oe	Accept any equivalent fraction, decimal form 0.45(45...) or percentage form 45(.45...)%
(b)	0.7	B1	for 0.7 oe	Accept any equivalent fraction eg $\frac{7}{10}$ or percentage form eg 70%
17	accurate drawing	M1	for drawing a side of length 6cm	
		A1	for correct triangle	
18	258 to 275	M1	for taking a correct reading from the graph that shows conversion of an amount in \$ to £	Must be a complete method to get to 345 Condone incorrect money notation if the meaning is clear
		M1	for a complete method eg attempts to read from the graph at using numbers that sum to 345 and finds the sum of their readings eg $6 \times 50 + 45$	
		A1	for answer in the range 258 to 275	
19 (a)	140	M1	for complete method eg $56 \div 40 \times 100$	May be seen in different ways, eg 2.5×56
		A1	cao	
	32	M1	for method to find percentage, eg $\frac{18}{56} \times 100$ (=32.14...)	
		A1	for an answer in the range 32 to 32.2	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
20	4	P1 P1 P1 A1	for start to process, eg $65 + 100 + 3 \times 5 + 1 \times 20 (= 200)$ or $3 \times 80 (= 240)$ for $65 + 100 + 3 \times 5 + 1 \times 20 (= 200)$ and $3 \times 80 (= 240)$ or “240” – 100 – 65 (=75) for process to find value of £10 notes in Carl’s wallet, eg “240” – “200” (= 40) or for “75” – $3 \times 5 - 1 \times 20 (=40)$ cao	May be part of an algebraic statement eg $65 + 100 + 35 + 10x$ NB $80 - 35 (=45)$ leading to 4 gets 0 marks
21 (a) (b)	25 Simon with reason	B1 C1	cao for Simon with reason Acceptable examples Simon; he uses more trials Simon; he does 10 times more Simon, since $100 > 10$ Simon because he threw it more frequently / often Simon since he has a larger range of results Not acceptable examples Paula Simon (unsupported) Simon because he threw it 100 times He gets more tails	If figures are given as part of the answer they must be correct
22		M1 A1	for square, side 6 cm or complete plan with incorrect scale cao	Do not award if the 6 cm square is included with a triangle attached externally (eg elevation)

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
23 (a)	n^8	B1	cao	May be seen as simplification in original fraction Accept c^1d^3 Must see carried out correctly, ie at least $5x > 7 \times 2$ not just intention seen. Allow other signs for this mark.
		M1	for partial simplification, eg c or d^3	
	cd^3	A1	for cd^3	
		M1	for $5x > 14$ or $5x = 14$ or critical value, $\frac{14}{5}$ oe	
(c)	$x > \frac{14}{5}$	A1	$x > \frac{14}{5}$ or $x > 2\frac{4}{5}$ or $x > 2.8$	
24	2 hours 45 minutes	P1	for $30 \div 24 (= 1.25)$ or $12 \div 8 (= 1.5)$	May be written in hours and/or minutes or 3 h 15 min or 2 h 75 min
		P1	for finding the sum of their two times eg “1.25” + “1.5” (= 2.75) or 165 (minutes)	
		A1	cao	
25	9.35, 9.45	B1	for 9.35 in the correct position	Accept 9.449 oe or 9.4499... oe
		B1	for 9.45 in the correct position	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
26 (a)	Yes (supported)	P1	for start of process, eg $5 \times 9 (= 45)$ or $10 \times 14 (= 140)$ or $5 \times 2 (= 10 \text{ (kg)})$ or $3 \div 2 (= 1.5 \text{ (boxes)})$	Accept values rounded or truncated to 1dp in both (a) and (b). Ignore units
		P1	for process using ratio of areas, eg $"140" \div "45" (= 3.1...)$ or for using ratio of amount of seed eg $"10" \div 3 (= 3.3...)$ or for finding coverage for 1 kg of grass seed, eg $"45" \div 3 (= 15 \text{ (m}^2\text{)})$	
		P1	for process to find amount of seed needed, eg $"140" \div "45" \times 3 (= 9.3... \text{kg})$ or $"140" \div "45" \times "1.5" (= 4.6... \text{(boxes)})$ oe or $"15" \times 2 (= 30 \text{ (m}^2 \text{ per box)})$ and $"140" \div "30" (= 4.6... \text{(boxes)})$ or for process to find area that can be seeded, eg $"10" \div 3 \times "45" (= 150 \text{ (m}^2\text{)})$ or $"140" \div "10" (= 14 \text{ (m}^2\text{)})$ oe	
		C1	for "Yes" supported by correct figures eg 4.6...(and 5), or 9.3...and 10 or 150 and 140 (or 140 to 148.5) or 15 and 14	
	(b) Yes, (does not have enough) (supported)	C1	for reasoning supported with correct figures, eg does not have enough seed and compares 9 (kg) with 9.3...(kg) or 4.5 (boxes) with 4.6... (boxes) or 135 (m ²) with 140 (m ²) or 14 (m ²) with 15 (m ²) ft from (a)	Accept 9.4 Accept 4.7 Values used in (a) do not need repeating in (b) as long as intention is clear

Paper: 1MA1/3F					
Question	Answer	Mark	Mark scheme	Additional guidance	
27 (a)	$\frac{1}{3}, \frac{2}{3}, \frac{1}{3}, \frac{2}{3}, \frac{1}{3}, \frac{2}{3}$	B2	six fully correct probabilities	Accept any equivalent fraction, decimal form 0.33(3...) and 0.66(6...) or 0.67 or percentage form 33(.3...) % and 66(.6...) % or 67%	
		(B1	at least 2 correct probabilities)		
(b)	$\frac{2}{9}$	M1	for $\frac{1}{3} \times \frac{2}{3}$ oe or ft probabilities from diagram		
		A1	for $\frac{2}{9}$ oe	Accept any equivalent fraction, decimal form 0.22(2...) or percentage form 22(.2...) %	
28 (a)	-2, 4	B1	cao	If answers are stated as coordinates, award M1 for both coordinates and M0 for one coordinate. With no extras	
(b)	0.55 to 0.65, 3.35 to 3.45	M1	for correct method, eg marking intercepts with x-axis or one correct answer or both solutions given as a coordinate eg (0.6, 3.4) or (0.6, 0) (3.4, 0)		
		A1	for answers in the ranges 0.55 to 0.65 and 3.35 to 3.45		
29	96	M1	for a complete process to find the volume eg $6 \times 4 \times 10 \div 2$ (= 120)		
		M1	for a complete process, eg $(6 \times 4 \times 10 \div 2) \times 0.8$		
		A1	cao SC B1 for 192		

