



Pearson
Edexcel

Mark Scheme (Results)

November 2018

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 2018

Publications Code 1MA1_3F_1810_MS

All the material in this publication is copyright

© Pearson Education Ltd 2018

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 (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 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 E.g. $2 \times 6 (=12)$ 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 E.g. "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 E.g. [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 (i)	43.7	B1	cao	Accept any other equivalent fraction to $\frac{5}{7}$
(ii)	$\frac{5}{7}$	B1	$\frac{5}{7}$ oe	
2	$\frac{3}{100}$	B1	cao	
3	1.2	B1	oe	Accept $\frac{12}{10}$ or $\frac{6}{5}$
4	90	B1	cao	
5 (a)	Cuboid	B1		
(b)	12	B1	cao	
6 (a)	Cross at $\frac{1}{2}$	B1	cross at $\frac{1}{2}$	Accept any other marks near to $\frac{1}{2}$ if the intention is clear; do not accept if any other marks are shown. Acceptable equivalents are equivalent fractions to $\frac{2}{6}$ eg $\frac{1}{3}$ decimal 0.33(...) or 33(..)%
(b)	$\frac{2}{6}$	B1	$\frac{2}{6}$ oe	
7	1.94 m or 194 cm	M1 A1	for 188 or 0.06 or 194 or 1.94 1.94 m or 194 cm	Do not accept numerical answers without the correct unit shown.

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
8	Yes with correct figures	P1 P1 P1 C1	begins to work with proportion eg $20 \div 2 (=10)$ or $20 \div 5 (=4)$ or $2.38 \div 2(=1.19)$ or $5.60 \div 5 (=1.12)$ full process to find the cost of 20 pens or 20 folders eg. $20 \div 2 \times 2.38 (=23.8)$ or $20 \div 5 \times 5.60 (=22.4)$ or $2.38 \div 2 \times 20 (=23.8)$ or $5.60 \div 5 \times 20 (=22.4)$ full process to find total price or amount remaining eg “23.8” + “22.4” (=46.2) or $50 - “23.8” - “22.4” (=3.8)$ Yes with correct figures eg 46.2 or 3.8 (left)	Throughout monetary units not required; trailing zeros not needed. Can work in pence throughout ‘Yes’ might be implied from working eg $46.2 < 50$ or a statement that 3.8 is left, but 46.2 alone must also show an answer such as ‘Yes’ (may be written elsewhere). Working leading to 46.2 must be shown for this mark.
9	(a) Trapezium	B1	cao	
	(b) C and D	B1	cao	Accept in either order.
10	Reflection drawn	C1	for accurate reflection drawn	Can be hand drawn. Need not be shaded.
11	40	P1 P1 A1	for $100 - 30 (=70)$ or $1 - 0.3 (=0.7)$ or $1 - \frac{3}{10} (= \frac{7}{10})$ or $28 \div 7 \times 3 (=12)$ for a complete process eg $28 \div (“70” \div 10) \times 10$ or $28 + “12”$ cao	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
12	Correct pie chart	M1 A1 A1	for method to find at least one angle eg P: $360 \div 60 \times 24 (=144)$ or C: $360 \div 60 \times 16 (=96)$ or M: $360 \div 60 \times 20 (=120)$ for all 3 angles correctly calculated OR at least one accurately drawn angle fully a correct labelled pie chart	Use the overlay Working may be seen in or by the table If three equal sectors of 120° with no working award 0 marks Labels as “vegetables” from table not just angle size. Accept P, C, M
13	50	P1 P1 P1 A1	for $45 \times 1.2 (= 54)$ or $34 \times 1.5 (=51)$ for $150 - “54” - “51” (= 45)$ for “45” \div 0.9 (=50) cao	
14	(a) 0.3 (b) 4 (c) 12	B1 B1 M1 A1	for 0.3 oe 4 or ft their (a) for 0.2×60 oe cao	Acceptable equivalents are 3/10 or 30% Answer on answer line takes precedence Do not accept a statement of probability (eg 0.1) Do not accept the use of any other probability

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	6	P1 P1 A1	for listing the multiples of 3 and 5 to at least the number 15 or $3 \times 5 (= 15)$ for considering multiples of 15, eg 4 multiples of 15 identified or $100 \div 15 (=6.6..)$ or an answer of 7 cao	3, 6, 9, 12, 15 and 5, 10, 15 If in a list of multiples of 3 and 5, multiples of 15 must be clearly identified Sight of $6.6(\dots)$ or $6\frac{2}{3}$ oe or an answer of 7 gets 2 marks.
16	30:1	M1 A1	for stating $450 : 15$ oe or $450 \div 15 (=30)$ oe or $1 : 30$ cao	$90 : 3$ Ignore units throughout.
17 (a)	Full working seen	M1 M1 C1	for an initial step with the expressions eg doubling $2x + 1$ or $x + 2$ or halving $4x$ or for identifying CD as $x + 2$ or for identifying DE as $2x + 1$ for an expression for the total perimeter, eg $4x + 2 \times (2x + 1) + 2 \times (x + 2)$ for full simplification and equating to 18	May be seen in working or on diagram
(b)	1.2	M1 A1	for isolating terms in x can ft an equation stated in (a) provided in form $ax + b = c$ for 1.2 oe	$10x = 18 - 6$ Accept $\frac{12}{10}$ or $\frac{6}{5}$

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
18	1204	P2 (P1 P1 A1)	for a full process to find 120% of 14200 eg, $1.2 \times 14200 (=17040)$ or $(0.2 \times 14200) + 14200 (=17040)$ for process to find 20% of 14200 eg, $0.2 \times 14200 (=2840)$ oe) for [cost] – 5000 cao SCB1 for answer of 920 if P0 scored	[cost] must be greater than 14200
19 (a)	Inequality shown	B2 (B1)	for fully correct solution with all three aspects with no ambiguity Aspect 1: circle at 4 Aspect 2: circle not shaded Aspect 3: arrow pointing left or line extending beyond –5, starting from their circle for any two aspects)	Circling the number 4 alone scores B0 Aspect 1 and Aspect 2 must relate to the same circle. Can work with an equation for both M marks Award 2 marks for an answer of $x \geq 6$ where \geq is an = or any incorrect inequality symbol, or for an answer shown as just 6.
(b)	4,5,6,7	B2 (B1)	for all four numbers in any order for 2 or 3 correct values with no errors or 4 correct values with one extra)	
(c)	$x \geq 6$	M1 M1 A1)	for a correct intention to subtract 5 from both sides or a correct intention to subtract x from both sides for a full method to solve the inequality or showing a critical value of 6 cao	

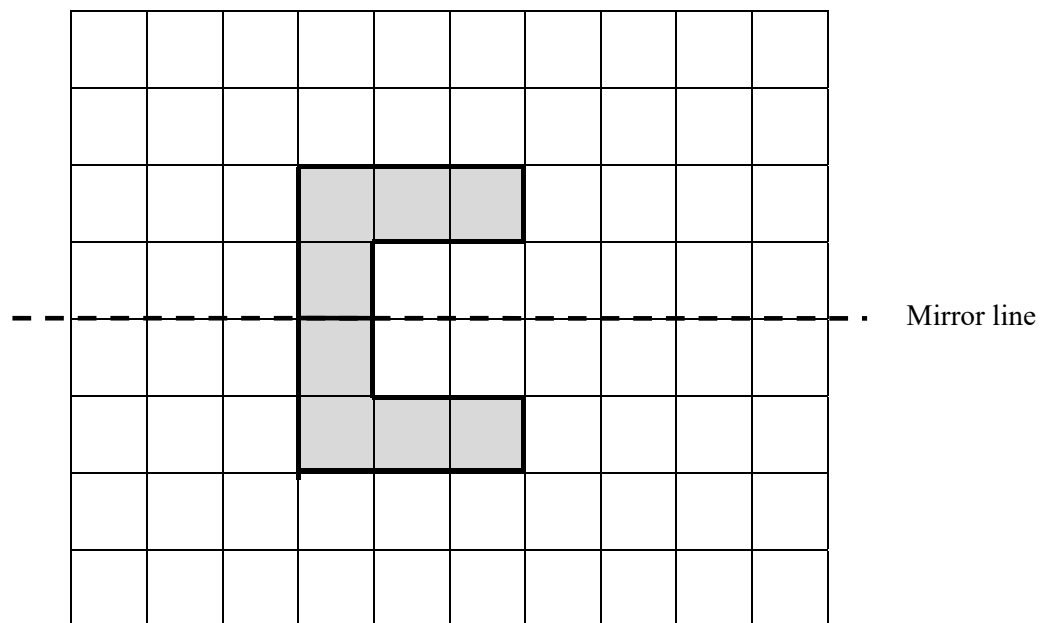
Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
20 (a)	7360	B1	cao	Answer must be given to at least 4 decimal places rounded or truncated Accept a clear indication of the decimal point. Check first four decimal places only
(b)	0.1077981356	B2 (B1	for 0.1077(981...) for 5.74(45626...) or 53.29 or 0.11 or 0.107 or 0.108)	
21	260 to 260.5	M1 M1 A1	for $883 - 245 (=638)$ or $883 \div 245 (=3.60..)$ or $883 \div 245 \times 100 (=360(.408..))$ oe for a complete method to find the percentage increase eg " $638 \div 245 \times 100 (=260(.408..))$ " or $883 \div 245 \times 100 - 100 (=260(.408..))$ oe Accept answers in the range 260 to 260.5	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
22 (a)	2, -4, 2, 8	B2 (B1)	all 4 values correct for 2 or 3 correct values)	
(b)	Graph	M1 A1	(dep B1) for at least 5 points plotted correctly ft from part a for a fully correct curve drawn	Accept freehand curves drawn that are not line segments; there must be some attempt to draw the minimum point below $y = -4$.
(c)	-2.6 or 1.6	B1	for 1 correct value, ft a non linear graph	Award for -2.6 or 1.6 or both values but do not award the mark if a correct value is given with an incorrect value. Accept 1.56 or -2.56 Note for ft to be applied the graph may be joined by line segments.

Paper: 1MA1/3F							
Question	Answer	Mark	Mark scheme	Additional guidance			
23 (a)	5	M1	“2” \div 40 \times 100	“2” comes from their reading of the height of the 20 to 24 column			
		A1	cao				
		(b)	9.5 shown		M1	for frequencies of 11, 8, 13, 6 and 2 (allow one error) or for midpoints 2, 7, 12, 17 and 22	May be seen on chart
					M1	for finding at least 4 products fx consistently within interval (including end points)	
					M1	for $\Sigma“fx” \div (“11” + “8” + “13” + “6” + “2”)$ or $(11 \times 2 + 8 \times 7 + 13 \times 12 + 6 \times 17 + 2 \times 22) \div 40$ OR $\Sigma“fx” (=380)$ and $9.5 \times (“11” + “8” + “13” + “6” + “2”)$ $(=380)$	
C1	for correct figures showing the answer or accurate figures to compare from correct working eg 380 from two calculations						

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
24 (a)	2 mins 48 secs	P1	for an appropriate first step eg $700 \div 475 (=1.47..)$ or $475 \div [\text{time}] (= 4.16.. \text{ m/s})$ or $[\text{time}] \div 475 (= 0.24 \text{ s/m})$	[time] what candidate indicates as time of first race Units are not needed and can be ignored if given
		P1	for a complete process to find the required time eg $700 \div 475 \times [\text{time}] (=168)$ or $700 \div (475 \div [\text{time}]) (=168)$ or $[\text{time}] \div 475 \times 700 (=168)$	Allow calculation in stages and appropriate rounding.
		A1	cao	
(b)	Statement	C1	eg takes less time Acceptable examples Quicker time Faster time Reduces my answer to part (a) Not acceptable examples It is an underestimate The amount of time could/may increase Laura goes faster	

Paper: 1MA1/3F				
Question	Answer	Mark	Mark scheme	Additional guidance
25	17.3	P1	for full process to find either angle eg $(180 - 90) \div (2+3) \times 2$ or for 36 or 54 seen as an angle	May be seen on diagram Condone correct values if incorrectly placed. This must be shown as an equation with all four elements (eg cos, [A], 14, AB) present. [A] could be 36 or any angle clearly and unambiguously identified as A. This also applies to [B] with Sine. If an answer is shown in the range in working and then incorrectly rounded award full marks.
		P1	for a correct equation using trigonometry eg $\cos [A] = 14 \div AB$	
		P1	(dep previous P mark) for rearranging their trigonometry equation to make AB the subject eg $(AB =) "14 \div \cos 36"$	
		A1	for an answer in the range 17.3 to 17.4	
26	$6n - 1$	M1	for $6n + k$, where $k \neq -1$ or missing	Accept a different variable for M1 only
		A1	oe	Note $n = 6n - 1$ gets M1 only



Modifications to the mark scheme for Modified Large Print (MLP) papers. Paper 3F.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:

Angles: $\pm 5^\circ$

Measurements of length: ± 5 mm

PAPER: 1MA1_3F		
Question	Modification	Mark scheme notes
1	Boxes removed	Standard mark scheme
5	Diagram enlarged. Model provided for all candidates.	Standard mark scheme
6	(a) Diagram enlarged. Numbers moved above the scale.	Standard mark scheme
9	Diagram enlarged. Labels added above the shapes. V and K versions – 5 cut out shapes provided. Wording changed from ‘The diagram shows five shapes on a centimetre grid.’ to ‘It shows five shapes on a grid of squares.’	Standard mark scheme
10	Diagram enlarged. Mirror line labelled on the left-hand side of the grid. Shading changed to dotted shading. Cut out shape provided for all candidates. Wording added ‘You do not need to shade your shape.’	Standard mark scheme

PAPER: 1MA1_3F

Question	Modification	Mark scheme notes	
12	Diagram enlarged. 10° markings added to the pie chart and a dot at the centre. Question wording changed from 60 people to 90 people. Frequencies changed as follows: Peas 40, Carrots 20, Mushrooms 30.	Amended mark scheme: M1 for method to find at least one angle eg P: $360 \div 90 \times 40 (=160)$ or C: $360 \div 90 \times 20 (=80)$ or $360 \div 90 \times 30 (=120)$ M1 for all 3 angles correctly calculated OR at least one accurately drawn angle A1 fully correct pie chart with labels	
14	Diagram enlarged. Spike removed and dot added. Table turned to vertical format.	Standard mark scheme	
17	Diagram enlarged. Wording 'A B C D E' added after pentagon. MLP only – x changed to y . Wording added 'Right angles are marked at A and E.' AB labelled $2y+1$, BC labelled $y+2$, AE labelled $4y$	Standard mark scheme	
19	(a)	Diagram enlarged.	Standard mark scheme
19	(c)	MLP only - x changed to p .	Standard mark scheme with x changed to p
22	Wording added 'There are four spaces to fill.' Table turned to vertical format. Grid enlarged. Y axis changed to go up in units of 2 from -10 to 10.	Standard mark scheme	
23	Diagram enlarged. Right axis labelled. Shading changed to dotted shading. Axes labels moved to the left of the horizontal axis and above the vertical axis.	Standard mark scheme	
25	Diagram enlarged.	Standard mark scheme	

