Mark Scheme (Results)

November 2017

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

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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 then mark both methods **as far as they are identical** and award these marks.

5   **Incorrect method**
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

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.

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

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: 1F				
Question	Working	Answer	Mark	Notes
1 (a)		3.65	B1	cao
(b)		2700	B1	cao
2		72	B1	cao
3		42	B1	cao
4		-9 , 2	B1	cao accept either order.
5		47	B1	cao
6		$L = 5a + 3$	M1	for expression $a - 1 + a + a + a + a + 4$ **or** $L=$ an expression in a
			M1	for $5a + 3$ **or** $L = a + a + a - 1 + a + a + 4$ oe
			A1	for $L = 5a + 3$
7 (a)		$(6 , - 2)$	B1	cao
(b) i		Correct point	B1	cao for point marked at (2, 9)
(b) ii		Yes with reasoning	B1	Yes with correct substitution $4 \times 2 + 1 = 9$ **or** by drawing correct line on diagram
(c)		Correct line	B1	for drawing line $x = -2$ cao

Question	Working	Answer	Mark	Notes
8		4 × 8 rectangle drawn	M1	Draws a rectangle with side lengths in the ratio 2:1 **or** lists possible dimensions in the ratio 2:1 **or** gives two numbers which multiply to 32
			A1	for correct diagram on grid
9		Identifies error in method	C1	Explanation of error eg she should have multiplied 348 by 2 not divided
10 (a)		Jake with reason	C1	Explanation referring to spread eg range **or** Jakes figures are closer together **or** highest and lowest values for both.
(b)		Reason	C1	Reason eg stem not used or it should be 26
11 (a)	30 ÷ 8	4	P1	for 30 ÷ 8 **or** 3.75 **or** 3 **or** counting up 8s towards 30 to at least 3 lots of 8 **or** 4 × 8(=32) oe
			A1	cao
(b)		No with reason	C1	No with 32 ÷ 8 **or** ft from (a)
12 (a)	**12** 7 19	Correct table	B3	Fully correct table
	18 **8** 26		(B2	for 5, 6, 7 or 8 figures correct)
	30 15 **45**		(B1	for given values entered correctly in the table **or** for a correct row **or** column)
(b)		$\frac{8}{45}$	B1	for $\frac{8}{45}$ **or** ft from values in table eg $\frac{"8"}{"45"}$

Question	Working	Answer	Mark	Notes
13		343	P1	for finding area of one face eg $294 \div 6$ (= 49)
			P1	for $\sqrt{\text{“49”}}$ (=7)
			P1	for "49" × "7" **or** for "7" × "7" × "7" oe
			A1	cao
14		$\frac{5}{7}$	P1	for $\frac{7}{5} = 1.4$ **or** $\frac{5}{7} = 0.7..$ **or** compares $\frac{1}{7}$ to $\frac{1}{5}$ **or** compare $\frac{5}{7}$ to 1 eg $1-\frac{5}{7}$ $(=\frac{2}{7})$ **or** compare $\frac{7}{5}$ to 1 eg $\frac{7}{5} = 1\frac{2}{5}$ **or** eg $\frac{49}{35}$ **or** $\frac{14}{35}$ **or** $\frac{25}{35}$ oe
		supported	P1	for $\frac{7}{5} = 1.4$ and $\frac{5}{7} = 0.7..$ **or** compares $\frac{5}{7}$ to 1 eg $1-\frac{5}{7}$ $(=\frac{2}{7})$ and $\frac{7}{5}$ to 1 eg $\frac{7}{5} = 1\frac{2}{5}$ **or** two correct fractions with common denominator eg $\frac{49}{35}$ and $\frac{25}{35}$
			C1	for $\frac{5}{7}$ with supporting evidence
15		45	M1	for a correct first step eg $\frac{9}{7+4+9}$ $(=\frac{9}{20})$ **or** $\frac{100}{7+4+9}$ (=5) **or** a full method for one of the other colours
			A1	cao

Question	Working	Answer	Mark	Notes
16 (a)		Explanation	C1	eg States over-estimated for both values
(b)		182.7(0)	P1	for a process to find 10% of a value stated in the question eg $\frac{10}{100} \times 5.80$ (=0.58) **or** $\frac{10}{100} \times 35$ (=3.5) oe **or** 35×5.80 (=203), allow 30×5.80 (=174) **or** $35 \times$ [reduced price]
			P1	for a process to find 90% of a value stated in the question eg $35 - $ "3.5" (=31.5) **or** 0.9×5.80 (=5.22) oe **or** $\frac{10}{100} \times$ "203" (=20.3) **or** $\frac{10}{100} \times$ "174" (=17.4) oe
			P1	for a complete process to find actual cost of 35 eg $0.9 \times 5.80 \times 35$ oe
			A1	cao SC B2 156.6(0)
17		$\frac{4}{9}$	M1	for listed outcomes (allow 1 error eg omission or repeat) **or** fractions $\frac{1}{3} \times \frac{2}{3} + \frac{2}{3} \times \frac{1}{3}$
			A1	for $\frac{4}{9}$ oe
18		135	M1	for $450 \div$ "2+3+5" (=45) **or** $\frac{3}{10} \times 450$ (=135) **or** 5 parts are 225 **or** 2 parts are 90 indicated
			A1	Cao

Question	Working	Answer	Mark	Notes
19		180, 210, 375, 3	M1	for $\frac{24}{16}$ **or** 1.5 **or** $\frac{16}{24}$ oe **or** 0.5 of any figure in the recipe calculated **or** amount of any ingredient for 1 flapjack or 3 (tablespoons)
			M1	for method to scale at least one ingredient in grams eg 120×1.5 **or** 140×1.5 **or** 250×1.5
			A1	for all quantities correct
20		Ami	M2	for an approximate calculation eg $\frac{600}{16+5}$ **or** $\frac{600}{21}$ **or** $\frac{600}{20}$ **or** $\frac{600}{20+5}$ **or** $\frac{600}{25}$ **or** $\frac{600}{25+5}$ **or** $\frac{600}{30}$ **or** $\frac{595}{20}$
		with estimate	(M1	for using 600 **or** 5 **or** 4)
			C1	Ami's answer /27.1115 is closest with accurately calculated figure from approximation
21		1.8×10^{-3}	M2	for $\frac{6 \times 10^{-2} \times 3 \times 10^{-4}}{1 \times 10^{-2}}$ or 18×10^{-4} or 0.0018 as the answer
			(M1	for 6×0.0003 **or** 0.06×0.03 **or** 1.8×10^{n} ($n \neq -3$) **or** $0.000018 \div 0.01$ **or** rewriting one number in standard form)
			A1	cao

Paper 1MA1: 1F				
Question	**Working**	**Answer**	**Mark**	**Notes**
22 (a)	$\frac{8}{20} + \frac{5}{20}$	$\frac{13}{20}$	M1	for suitable common denominator with one fraction out of two correct **or** 0.4 + 0.25
			A1	for $\frac{13}{20}$ **or** 0.65 oe
(b)		$\frac{1}{8}$	B1	Accept 0.125
23		2×2×3×3	M1	for complete method to find prime factors; could be shown on a complete factor tree with no more than 1 arithmetic error or 2,2,3,3,(1)
			A1	for 2×2×3×3 oe
24		14:21:42	P1	for 2 out of 3 expressions in one letter eg from x, x+7 2x+14 **or** see a set of numbers to show interpretation of the relationships, eg 10, 17, 34
			P1	(dep) for sum of their 3 expressions =77 eg $x + x$+7+2x+14 =77 oe **or** 2 systematic correct trials including addition
			P1	for a correct process to isolate their term in x **or** x=14
			A1	for ratio 14:21:42 oe

Paper 1MA1: 1F				
Question	**Working**	**Answer**	**Mark**	**Notes**
25	*CB* extended to form *CG*	Reasoning	B1	for 35 **or** 75 **or** 145 **or** 105 **or** *DEF* = 70, marked on the diagram or 3 letter description
			M1	for 180−70−35 **or** 180−75−35 **or** a correct pair of angles that would lead to 75 or 70, eg *AFB* = 35 and *FAB* = 75 **or** *AFB* = 35 and *ABG* = 75 **or** *FBC* = 35 and *ABG* = 75 **or** *EDF* = 75 and *DEF* = 70 **or** *FDC* = 105 and *FBC* = 35 **or** *ABC* = 105 and *FBC* = 35
			C2	(dep on B1M1) All figures correct with all appropriate reasons stated. Angles must be clearly labelled or on the diagram. Full solution must be seen
			(C1	(dep on B1 or M1) for one reason clearly used and stated.) <u>Corresponding</u> angles are equal, <u>alternate</u> angles are equal, <u>opposite angles</u> in a <u>parallelogram</u> are equal, <u>angles</u> in a <u>triangle</u> sum to 180, <u>angles</u> on a straight <u>line</u> sum to 180, vertically <u>opposite angles</u> are equal, <u>vertically opposite</u> angles are equal, <u>angles</u> in a <u>quadrilateral</u> sum to 360, <u>co-interio</u>r angles sum to 180, <u>allied</u> angles sum to 180, <u>angles</u> around a <u>point</u> sum to 360

Question	Working	Answer	Mark	Notes
26		Daisy is wrong	P1	for process to find area of any relevant circle ie $\pi \times 4^2$ $(=16\pi)$, $\pi \times 7^2$ $(=49\pi)$, $\pi \times 10^2$ $(=100\pi)$ **or** 7^2 and 4^2
		(supported)	P1	for completed method to find shaded area eg "$\pi \times 7^2$" – "$\pi \times 4^2$" $(=33\pi)$ **or** use of radii eg $7^2 – 4^2$ $(=33)$
			A1	for 2 comparable figures, eg 33π and 100π **or** 33 and 100 **or** 103 to 103.7 and 314 to 314.2 **or** 103 to 103.7 and 104.6 to 104.8
			C1	statement eg No because it should be $\frac{33}{100}$ and their accurate figures Allow use of $\pi = 3$ or better
27 (a)		365	M1	*fx* with *x* consistent within intervals eg 200×1 , 300×11 , 400×5 , 500×0 , 600×3, if 200, 3300, 2000, 0, 1800 are seen without working then condone 1 error
			M1	(dep) $\Sigma fx \div \Sigma f$ eg "7300" ÷ 20
			A1	Cao
(b)		Comment	C1	for comment about outliers affecting mean

Question	Working	Answer	Mark	Notes		
28		Shows reasoning to reach *y*=3	M1	forms equation eg $2x + 6 = 5x – 9$	$48 \div 3$ (=16)	$3(2x + 6) = 48$ **or** $3(5x – 9) = 48$, condone missing bracket
			M1	isolates *x* and number terms $3x = 15$	forms equation $2x+6=$"16" **or** $5x – 9=$ "16"	Isolates *x* and number terms $6x =$ "30" **or** $15x =$ "75"
			M1	substitutes "5" into side length eg $2 \times 5 + 6$ (=16)	isolates *x* and number terms $2x=$ "10" **or** $5x =$ "25"	forms the second equation
			A1	$48 \div 16 = 3$ **or** $16 \times 3 = 48$	shows *x*=5 for both solutions	*x*=5 from 2 different equations.
29		Comment	B1	for correct mathematical comment eg line segments not a curve **or** should draw freehand **or** should not use a ruler, **or** should be a curve NB Do not accept statements about scale or plotting accuracy.		
30		4	M1	for a complete method eg $2.80 \times 100 \div (100-30)$ oe **or** $2.80 \div 0.7$ oe **or** for build up method but must show all intermediate steps unless all figures are correct eg $2.8 \div 7 = 0.4$ and "0.40" $\times 10$ (=4)		
			A1	cao		

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

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: ±5°
Measurements of length: ±5 mm

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
4		Boxes enlarged	Standard mark scheme
6		Diagram enlarged. Braille only: the letter a has been changed to the letter r	Standard mark scheme but read a and r for braille.
7		Diagram enlarged. Cross changed to a solid dot. Wording added "It shows a grid".	Standard mark scheme
8		Diagram enlarged. Wording added 'It shows a grid of squares.' Wording changed to 'Draw the rectangle on the grid of squares. Each square on the grid represents a one centimetre square.'	Standard mark scheme.
10	(b)	Key moved above and to the left of the diagram. A horizontal line has been added to the bottom row of the stem and leaf diagram	Standard mark scheme.
12		Wording added 'There are nine spaces to fill.' Braille only: answer spaces have been labelled from (i) to (ix): Long hair: (iv), (viii), (vii) Short hair: (v), (iii), (vi) Total (ii), (ix), (i)	Standard mark scheme.

PAPER: 1MA1_1F			
Question		**Modification**	**Mark scheme notes**
17		Wording added 'It shows two boxes, Box A and Box B.' Diagram enlarged. Boxes have been made into a rectangle and the cards have been placed inside the rectangles horizontally. Braille only: the diagram has been removed and replaced with information about the diagram.	Standard mark scheme
25		Diagram enlarged. Angles moved outside the angle arcs and the angle arcs made smaller. Arrow heads made longer and more obvious. Wording added 'AD is parallel to BC. AB is parallel to EC.'	Standard mark scheme
26		Diagram enlarged. Cross changed to a solid dot. Shading changed to dotty shading.	Standard mark scheme
27		Frequency column has been extended to allow for working	Standard mark scheme
28		Diagram enlarged. Wording added 'All marked angles are right angles.' MLP only: x changed to e, y changed to f. Braille only: will label the corners of the rectangle A to D and will give information about the rectangle.	Standard mark scheme, except for MLP in the mark scheme read e for x, and f for y.
29		Diagram enlarged. Crosses changed to solid dots.	Standard mark scheme

Mark Scheme (Results)

November 2017

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 2F

Paper: 1MA1/2F				
Question	Working	Answer	Mark	Notes
1		0.07	B1	cao
2		42 or 48	B1	42 or 48
3 (a)		15*fg*	B1	cao
(b)		*t*²	B1	cao
(c)		4*n*	B1	cao
4 (a)		6	P1	for process to find the total weight of one type of fruit eg 4 × 125 (=500) or 2 × 170 (=340) or 3 × 135 (=405) or 1245
	1785−1245 =540		P1	complete process to find the total weight of oranges eg "1785" – ("500" + "340" + "405") or sight of digits 54 or answer given as 0.6 or 60
	540 ÷ 90		A1	cao SC B1 for answer of 15
(b)(i)		No	P1	Starts process, eg 1000 ÷ 75 (digits 13(.3..) seen) or 15 × 75 (= 1125) or 1.125 or showing 1000 ÷ 15 (=66(.6..)) or counts to 975 or 1050
		(supported)	C1	"No" with correct working eg as evidenced by work from P1 mark.
(b)(ii)		Comment	C1	for valid comment, eg may get enough tomatoes if tomatoes weigh less than assumed (75g), not if weight is more than 75g.

Question	Working	Answer	Mark	Notes
5 (a)		$\dfrac{33}{60}$	M1	for method to find number of students who did not walk to school eg $15 + 12 + 6$ or $60 - 27$ (=33) or 0.55 or for $1 - \dfrac{27}{60}$
			A1	for $\dfrac{33}{60}$ or equivalent fraction
(b)		Pie chart drawn	M1	for method to find the angle for at least one sector eg $\dfrac{27}{60} \times 360$, $\dfrac{12}{60} \times 360$, $\dfrac{6}{60} \times 360$, $27 \div \dfrac{60}{360}$, $12 \div \dfrac{60}{360}$, $6 \div \dfrac{60}{360}$ oe (0.166..) NB: could be implied by one angle drawn accurately.
			M1	for drawing at least one sector accurately (from 4 sectors) eg 162° or 72° or 36°
			A1	for an accurately drawn pie chart
			B1	(dep on 4 sectors with at least one accurately drawn) for showing labels Walk Car Bicycle
6 (a)		$\dfrac{3}{7}$	B1	for $\dfrac{3}{7}$ or equivalent fraction
(b)		3 : 1	B1	for 3 : 1 or equivalent ratio

Question	Working	Answer	Mark	Notes
7		No	B1	for showing 11 or 13 or 17 or 19 with no non-prime numbers between 10 and 20, or for showing 23 or 29 with no non-prime numbers between 20 and 30. Ignore any numbers shown below 11.
		(supported)	C1	"No" supported by listing 11, 13, 17, 19 and 23, 29 and no non-prime
8 (a)		Statement	C1	States one thing wrong eg vertical scale is not linear oe
(b)		Trend described	C1	eg the trend is upwards, positive (trend) oe
9 (a)		2.75	M1	for accurately measuring the distance between Backley and Cremford as 5.3 cm – 5.7 cm oe or their measurement × 0.5 oe
			A1	for answer in the range 2.65 to 2.85
(b)		130	B1	for answer in the range 128 to 132
10 (a)		12 cm²	B1	for numerical answer of 12
			B1	for units shown as cm²
(b)		kite	B1	cao

Question	Working	Answer	Mark	Notes
11		5 : 2 : 10	P1	for process to calculate total for quiz or total of membership fees eg. 13 × 5 + 35 (=100), 25 × 20 (=500)
			P1	for complete process to write (correct) figures as a ratio, eg 250 : 100 : 500 oe in any order (condone inclusion of units or words)
			A1	cao
12 (a)		23, 177	C3	Completes all information correctly.
		10, 13, 85, 92	(C2	3 or 4 correct frequencies or all correct probabilities)
			(C1	2 correct frequencies)
(b)		$\dfrac{13}{23}$	M1	ft oe for $\dfrac{a}{23}$, $a < 23$ or $\dfrac{13}{b}$, $b > 13$
			A1	ft oe from (a)

Question	Working	Answer	Mark	Notes
13		Shown	M1	for method started to find comparable amounts, eg 17 × 46 (=782) or 17 × 0.46 (=7.82) or 17 × 35 (=595) or 266 ÷ 35 (=7.6) or 26600 ÷ 35 (=760)
			M1	for complete method to find comparable figures eg 17 × 46 (=782) or 17 × 0.46 (=7.82) AND 266 ÷ 35 (=7.6) or 26600 ÷ 35 (=760) eg 17 × 46 × 35 (=27370) or 17 × 0.46 × 35 (=273.7)
			C1	Shows correct comparable figures eg 7.82 and 7.6(0), 782 and 760 OR 273.7(0)
14 (a)		Example	M1	Chooses two odd numbers and substitutes into $2(a + b)$ oe
			C1	Calculates $2(a + b)$ correctly to arrive at a number that is a multiple of 4
(b)		Reasoning	C1	States $a + b$ is even or $2a$ is even or $2b$ is even
			C1	Completes argument.

Question	Working	Answer	Mark	Notes
15		988	P1	for a process to find the amount of oil bought in November, eg 750 ÷ 0.5 (=1500) or 75000 ÷ 50 (=1500)
			P1	for a process to find the amount of oil ordered in February, eg "1500" +1000 − 600 (= 1900)
			P1	(indep) for a process to calculate a 4% increase of their amount of oil, eg or "1900" × 1.04 (=1976) or increase in price eg 1.04 × 50 (=52 or 0.52) or 1.04 × 750 (=780)
			P1	for a complete process to find the total cost of the calculated amount of oil eg "52" × "1900" or "780" × "1900" ÷ "1500"
			A1	Cao
16		$1\frac{1}{2}$	M1	for correct expansion of the bracket or dividing all terms by 3 as a first step eg $3x - 3$ or $(5x - 6)/3 = 3(x - 1)/3$
			M1	for isolating terms in x on one side of an equation eg $5x - 6 - 3x = -3$ or both constants on one side of an equation, eg $5x = 3x - 3 + 6$, ft $5x - 6 = 3x - 1$
			A1	for $1\frac{1}{2}$ oe
17	£6 − £5.64 = 36p or 50p – 47p = 3p	6.4	P1	for a strategy to compare the same number of bottles e.g. £5.64 ÷ 12 (= 47 or 0.47) or 12 × 50p (= 6 or 600) or 36 or 0.36 or 3 or 0.03
			P1	for start of process to find percentage profit e.g. $\frac{"36"}{564}$ or $\frac{"3"}{"47"}$ or $\frac{"6"}{5.64}$ or $\frac{50}{"47"}$ oe with consistent units
	6.3829787…%		A1	for answer in the range 6.3 to 6.4

Question	Working	Answer	Mark	Notes
18 (a)		31.4	P1	for working with circumference formula, eg $\pi \times 80$ (=251.(….)) oe
			A1	for answer in the range 31.4 to 31.5 accept 10π
(b)		No (supported)	C1	Mean distance stays the same with reason, eg total distance remains unchanged or same number of points
19		$\dfrac{1}{11}$	P1	for starting the process, eg by writing down a correct ratio or using a given number of cubes for one relationship, eg 2B 1Y or B:Y = 2:1 or 4G 1B or G:B = 4:1 or 8G, 1Y or G:Y = 8:1 oe or yellow = 2, blue = 4, or states 2:1:8 oe in any order (can be algebraic)
			P1	for complete process to find possible number of each colour or equivalent ratio, eg 8G 2B 1Y or G:B:Y = 8:2:1 oe or yellow = 2, blue = 4, green = 16 oe (can be algebraic)
			A1	$\dfrac{1}{11}$ oe
20 (a)		(−2, 1) (−4, 1) (−2, 2) (−5, 2)	B1	Shape labelled **A**
(b)		(1, −4) (3, −4) (1, −5) (4, −5)	B1	Shape labelled **B**

Question	Working	Answer	Mark	Notes
21 (a)		6	B1	cao
(b)		5	B1	cao
(c)		Shown	M1	for writing 100^a or 1000^b as a power of 10 (=10^{2a} or 10^{3b}) or 10^{2a+3b} or $100 = 10^2$ and $1000 = 10^3$
			C1	for complete chain of reasoning leading to conclusion

Question	Working	Answer	Mark	Notes
22		32.3	P1	for using Pythagoras to find length of third side of triangle, eg $7.5^2 - 6^2$ or $6^2 + x^2 = 7.5^2$ or uses trigonometry to find angle in triangle eg $\sin A = \dfrac{6}{7.5}$ or $\cos B = \dfrac{6}{7.5}$
			P1	(dep P1) for complete process to find length of third side of triangle eg $\sqrt{7.5^2 - 6^2}$ or $\sqrt{56.25 - 36}$ or $\sqrt{20.25}$ (=4.5) or uses trigonometry to find base length of triangle eg $7.5 \times \cos$ "A" or $7.5 \times \sin$ "B" or $\dfrac{6}{\tan " A"}$
			P1	(dep P2) for $24 - 10 -$ "4.5" (= 9.5)
			P1	(indep) for process to find angle CDA, eg $\tan CDA = \dfrac{6}{base}$ from right-angled triangle
			A1	for answer in the range 32.2 to 32.3
23 (a)		2.7560…	M1	for 1.0654(059…), 0.1402(633…), 7.5957(541…), 2.756 truncated or rounded to no less than 2dp
			A1	for 2.7560(….)
(b)		2.76	B1	for 2.76 ft from (a)

Paper: 1MA1/2F				
Question	Working	Answer	Mark	Notes
24 (a)		±6	M1	for one value (6 or −6) or √36 or an embedded answer eg $2 \times 6^2 = 72$
			A1	±6
(b)	$6x^2 - 4x + 3x - 2$	$6x^2 - x - 2$	M1	for at least 3 terms correct out of a maximum of 4 from expansion, or 4 terms correct ignoring signs.
			A1	cao
(c)		$(x + 3)^2$	B1	for $(x + 3)^2$ or $(x + 3)(x + 3)$

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

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.
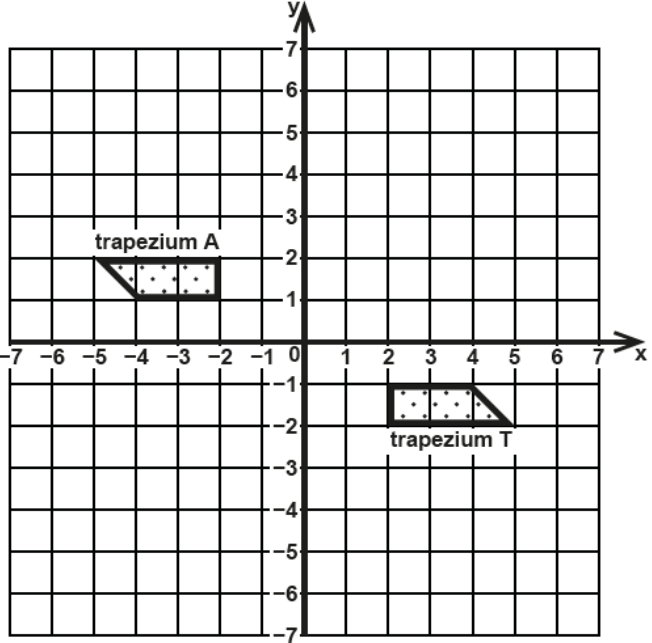
The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm
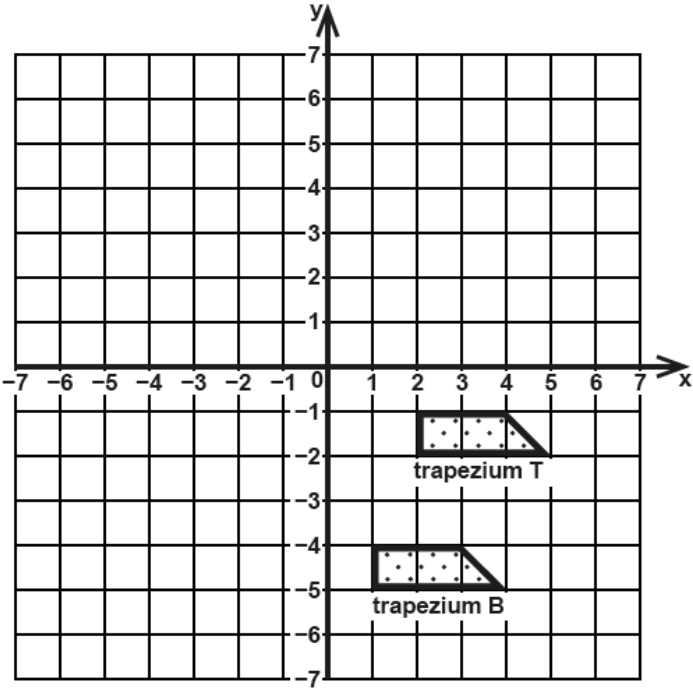
PAPER: 1MA1_2F		
Question	**Modification**	**Mark scheme notes**
5	Table has been turned to vertical format and left aligned. Numbers in the table have changed to: Bus: 15, Walk: 10, Car: 30 and Bicycle: 5. Then in part (b): Diagram enlarged. 10 degree markings have been added to the pie chart. Wording added 'It shows a pie chart.'	(a) M1 … eg 15+30+5 or 60 – 10 (=50) or 0.83(..) or 1 – 1/10 oe A1 for 5/6 or equivalent fraction (b) M1 for method to find the angle for at least one sector eg $\frac{10}{60}\times360$, $\frac{30}{60}\times360$, $\frac{5}{60}\times360$, $10\div\frac{60}{360}$, $30\div\frac{60}{360}$, $5\div\frac{60}{360}$ oe (0.166..) NB: could be implied by one angle drawn accurately. Then standard mark scheme for angles W: 60°, C: 180°, B: 30°
8	Diagram enlarged. Crosses have been changed to solid dots. Axes labels have been moved to the left of the horizontal axis and above the vertical axis.	Standard mark scheme

PAPER: 1MA1_2F		
Question	**Modification**	**Mark scheme notes**
9	Outline of the map has been removed. North lines have been made 10cm to allow for use of specialist equipment. Cremford point has been moved so the distance between Backley and Cremford is now 11cm. The scale has been moved above and to the left of the diagram. Question wording changed to 'It shows the position of two villages, Backley and Cremford.'	(a) M1 for accurately measuring the distance between Backley and Cremford as 10.8 cm – 11.2 cm oe or their measurement × 0.5 oe A1 for ans in the range 5.4 to 5.6 (b) standard mark scheme
10	Diagram enlarged. Shading removed. Shape P has been moved up one square. The grid has been reduced by removing a row from the bottom, top and right side. Wording changed to 'It shows two shapes drawn on a grid of squares. Each square on the grid represents a one centimetre square.' Labels 'P' and 'Q' removed from inside of the shapes and labelled 'shape P' and 'shape Q'.	Standard mark scheme
12	Diagram enlarged. Wording added 'It shows a frequency tree.' Wording added 'There are six spaces to fill.' Braille: will label the spaces to fill (i) to (vi).	Standard mark scheme
14	Braille only: a changed to s, b changed to t.	Standard mark scheme but for Braille letters changed as indicated.
18	Both diagrams enlarged and put on the same page in the diagram book. Wording changed to 'There are 8 points equally spaced on the circumference of the circle, as shown in the diagram for Question 18(a)'. Wording changed to 'Four of the points are moved, as shown in the diagram for Question 18(b)'.	Standard mark scheme

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
20		The grid has been split into two parts for part (a) and part (b).	
20	(a)	Question reversed. Trapezium T and A have been put on a grid. Question wording changed to 'It shows trapezium T and trapezium A given on a grid. Describe the single transformation that maps trapezium T onto trapezium A'. 3 answer lines and have been provided	B1 for "Rotation 180° about the origin"

Question		Modification	Mark scheme notes
20	(b)	Question reversed. Question wording changed to 'It shows trapezium T and trapezium B given on a grid. Write down the vector that translates trapezium T onto trapezium B.' Vector brackets have been provided.	B1 for the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$

PAPER: 1MA1_2F				
Question		**Modification**		**Mark scheme notes**
21	(c)	MLP and braille: a changed to e, b changed to f.		Standard mark scheme but for Braille letters changed as indicated.
22		Diagram enlarged. Arrows have been removed from 10cm and 6cm. Wording added 'BC = 10cm, AB = 7.5cm, AD = 24cm. The vertical height of the trapezium is 6cm.'		Standard mark scheme.
24		MLP and braille: x changed to y.		Standard mark scheme but for Braille letters changed as indicated.

Mark Scheme (Results)

November 2017

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

Paper: 1MA1/3F				
Question	**Working**	**Answer**	**Mark**	**Notes**
1		4000	B1	for 4000
2		2*y*	B1	for 2*y*
3		1, 2, 3, 6, 9, 18	B2	for all 6 factors with no incorrect
			[B1	for at least 3 factors with no more than one error]
4 (a)	$5.80 \times 3 + 7.80 = 25.20$	90p or £0.90	M1	for a correct first step from which a complete method could be developed, eg. 5.8(0) × 3 (= 17.4(0)) or 24.3(0) − 7.8(0) (= 16.5(0))
			M1	for complete method, eg. 7.8(0) + 5.8(0) × 3 − 24.3(0) (= 0.9(0))
			A1	for answer in correct notation with correct units, eg. 90p or £0.90 (accept £0.90p and £0.9)
				[SC: B1 for an answer of £2.90]
(b)		8.27pm	M1	for using 60 mins = 1 hour in the conversion of 102 minutes, eg. 1 h 42 mins or 1.42 or 1.7 or (60 + 42) mins or 102 − 60 or 102 ÷ 60 or for an answer of 8.27am or 08.27
			A1	for 8.27(pm) oe
5		13	M1	for the start of a method, eg. 2 × 1000 (= 2000) or 150 ÷ 1000 (= 0.15) or 1000 ÷ 150 (= 6.66…)
			M1	for a fully correct method, eg. 2000 ÷ 150 or 2 ÷ 0.150 or 13.3(...)
			A1	cao

Question	Working	Answer	Mark	Notes
6		Correct pictogram with key	C3 [C2 [C1	for a fully correct pictogram, including key for 2 circles drawn for Friday or $3\frac{3}{4}$ circles (or equivalent) drawn for Saturday] for deducing that one circle represents 4 cycles (or 20 ÷ 5) or $\frac{1}{2}$ circle represents 2 cycles or $\frac{1}{4}$ circle represents 1 cycle]

7		shown	M1
			
			M1
			
			C2
			
			[C1
			
			OR
			
			M1
			
			M1
			
			C2
				for (angle *BCA*) = 180 – 117 (= 63)
				
				for (angle *CAB*) = 180 – "63" – 54 (= 63) or (angle *CAB*) = 117 – 54 (= 63)
				
				for statement, eg. isosceles since angle *BCA* = angle *CAB* = 63 with fully correct reasons,
				from: <u>angles</u> on a straight <u>line</u> add up to 180º
				       <u>angles</u> in a <u>triangle</u> add up to 180º
				       <u>exterior angle</u> of a <u>triangle</u> is equal to sum of interior opposite angles
				
				for angle *BCA* = 63 and angle *CAB* = 63 and one of the above reasons]
				
				OR
				
				for $\frac{(180-54)}{2}$ (= 63)
				
				for identification of **two** angles in triangle *ABC* being "63"
				
				for statement, eg. isosceles since angle *BCA* = angle *CAB* = 63 **and** <u>angles</u> on a straight <u>line</u> add up to <u>180</u>º **and** fully correct reasons:
				      base angles of an <u>isosceles triangle</u> are equal
				  and <u>angles</u> in a <u>triangle</u> add up to 180º

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
			[C1	for angle *BCA* = 63 and angle *CAB* = 63 and one reason from: base angles of an <u>isosceles triangle</u> are equal <u>angles</u> in a <u>triangle</u> add up to 180º]
8		30	M1	for 12 m = 1.9 to 2 cm or for a scale factor of 2.25 to 2.75 (comparing length of bus with height of the building) or a **complete** method using the height of the bus to compare with the height of the building.
			A1	answer in range 27 to 33
9		2, 7 or 3, 13 or 5, 11 or 2, 23	M1	for identifying two different prime numbers or two numbers which add up to give a square number or for a list of at least 3 prime numbers with no errors **and** a list of 3 square numbers with no errors.
			A1	for two correct prime numbers
10		60	M1	for method to find the number, eg. $48 \times \frac{3}{2}$ (=72) or to find $\frac{1}{6}$ th of the number, eg. $48 \div 4$ (=12)
			A1	cao

Paper: 1MA1/3F				
Question	Working	Answer	Mark	Notes
11		Offer 1	P1	for a process to find the cost of a number of lessons in Offer 1, eg. 24 × (12 – 1) (= 264) or for a process to find 5% (or 95%) of an appropriate amount, eg. 24 × 0.05 (= 1.20) or 24 × 0.95 (= 22.80) in Offer 2
		(supported)	P1	for a complete process leading to values to be used for comparison, eg. 24 × (12 – 1) (= 264) and 24 × 0.95 × 12 (= 273.60)
			C1	Offer 1 and correct values, eg. (£)264 and (£)273.6(0) used for comparison
12	Complete methods $3.60 ÷ 2.5 × 3.5$ or $3.60 ÷ 5 × 7$ or $3.5 ÷ (2.5 ÷ 3.6)$ or $\frac{3.5}{2.5} × 3.6$ or $3.6 ÷ \frac{2.5}{3.5}$	5.04	M1	for a correct first step to find the cost of a unit of weight (eg. 1 kg or 0.5 kg) eg $3.60 ÷ 2.5$ (= 1.44) or $3.60 ÷ 5$ (= 0.72) or a complete alternative method
			A1	for 5.04 (accept £5.04p)
13 (a)		(–2) **–1.5** **–1** **–0.5** (0) **0.5**	B2 [B1	for a fully correct table for 2 or 3 correct entries]
(b)		Correct line	M1	for correctly plotting at least 5 of their points (provided B1 scored in part (a)) or for a straight line with gradient 0.5 or for a straight line through (0,–1) with a positive gradient
			A1	for a correct line between $x = –2$ and $x = 3$
(c)		2.6	B1	for answer in the range 2.5 to 2.7 or ft a single straight line with positive gradient

Paper: 1MA1/3F				
Question	**Working**	**Answer**	**Mark**	**Notes**
14		Reflection	B1	for reflection
		in the *x*-axis (or *y* = 0)	B1	for *x*-axis (or *y* = 0) NB: award no marks if more than one transformation is given
15		(£6), 18, 24, 27	M1	demonstrates a proportional method to find at least one cost for cotton, eg. £6 ÷ 2 × 9 (= (£)27) or a correct entry in the table.
		15, 45, 60, 67.50	M1	demonstrates a proportional method to find at least one cost for silk, eg. £6 ÷ 2 × 5 (= (£)15) or a correct entry in the table.
			A1	for a fully correct table (accept 67.5(0))

Question	Working	Answer	Mark	Notes
16 (a)		40	P1	for the start of a process to find the number of boxes that will fit along one edge, eg. $240 \div 40$ (= 6) or $150 \div 30$ (= 5) or $140 \div 35$ (= 4) or $240 \div 30$ (= 8) or $240 \div 35$ (= 6.85… ie 6 boxes), etc. or for a process to find a volume, eg. $40 \times 30 \times 35$ (= 42000) or $0.4 \times 0.3 \times 0.35$ (= 0.042) or $240 \times 150 \times 140$ (= 5040000) or $2.4 \times 1.5 \times 1.4$ (= 5.04) NB: condone incorrect or no conversion between m and cm
			P1	for a complete process to find the maximum number of boxes, eg. "6" × "5" × "4" (= 120) or "5040000" ÷ "42000" (= 120) or "5.04" ÷ "0.042" (= 120)
			P1	(dep on P1) for (their number of boxes) ÷ 3, eg. $120 \div 3$ (= 40)
			A1	cao
(b)		explanation	C1	for explaining that it could take more time or it could take less time **with** an appropriate reason, eg. "less space means less number of boxes which will take less time" or "it will take more time since a different arrangement would be required"
17 (a)		$4(m + 3)$	B1	for $4(m + 3)$ or $2(2m + 6)$
(b)		term, expression	B1 B1	for 'term' in the 1st space for 'expression' in the 2nd space

Question	Working	Answer	Mark	Notes
18 (a)		$3n + 1$	M1	for a method to deduce the nth term, eg. $3n + k$, where k is an integer or k is omitted or for $n = 3n + 1$
			A1	for $3n + 1$ oe (accept n replaced by another letter)
(b)		No (supported)	C1	for using (their expression in (a)) = 90 or shows that 88 or 91 is in the sequence
			C1	for an answer of "No" and a convincing argument eg. pattern number 30 has 91 counters or $(90 – 1) ÷ 3$ (= 29.66…) or shows that the next term after 88 is 91 Note: no ft from (a)
19 (a)		$160 < h \le 170$	B1	correct class interval
(b)		Line segments joining the points (135, 4), (145, 11), (155, 24), (165, 22) and (175, 19)	C2 [C1	for fully correct frequency polygon for points plotted correctly at midpoints of intervals OR joining points with line segments at the correct heights and consistent within the intervals (including end values) OR correct frequency polygon with one point incorrect OR correct frequency polygon with first and last point joined] NB: ignore any histogram drawn and any part of frequency polygon outside range of first and last points plotted

Paper: 1MA1/3F				
Question	**Working**	**Answer**	**Mark**	**Notes**
20		New York (supported)	P1	for changing between £ and $, eg 1.089×1.46 (= 1.58(9.)) or 2.83÷1.46 (= 1.93(8.)) or between litres and gallons, eg 1.089×3.785 (= 4.12(1.)) or 2.83÷3.785 (= 0.74(7.))
			P1	for a complete process to give values that can be used for comparison, eg "1.938..." ÷ 3.785 (= 0.51(2.)) **or** "1.589..."...× 3.785 (= 6.01(7.)) **or** 1.089 × 3.785 = (4.12(1.)) and 2.83 ÷ 1.46 (= 1.93(8.))
			C1	for New York and correct comparative values.
21		648	M2	a complete method, eg 12.5 × 1000 ÷ 19.3
			[M1	for using volume = mass/density, eg 12500 ÷ 19.3 (condone inconsistent units or incorrect conversions) may be implied by digits 647... or 648...]
			A1	for answer in range 647 to 648
22		15	P1	strategy to start the problem, eg $8:20$ and $20:5$
			P1	process to solve the problem, eg $\dfrac{5}{33}\times100$ or $24:60:15$
			A1	cao
23 (a)		0.625	B1	cao
(b)		$9.75 \leq x < 9.85$	B2	$9.75 \leq x < 9.85$
			[B1	for 9.75 **or** 9.85 (or $9.84\dot{9}$)]

Question	Working	Answer	Mark	Notes
24		147	P1	starts process, eg uses x and $x + 7$
			P1	starts to work with at least 6 correct sides, may be on the diagram or in an expression
			P1	(dep on previous P1) gives a correct expression for the perimeter, eg $x + x + 7 + x + 7 + x + 7 + x + x + 7 + x + 7 + x + 7$ or adds at least 6 correct sides and equates to 70
			A1	for width = 3.5 oe **and** length = 10.5 oe
			B1	ft (dep P2) for correct area for their x
25		0.000 745 2	M1	for digits 7452 seen
			A1	cao
26 (a)		Mel (supported)	B1	Mel with reference to greatest number of throws
(b)		$\dfrac{2}{9}$	M1	selects overall total and multiplies P(point up)×P(point down) eg $\dfrac{50}{150} \times \dfrac{100}{150}$ oe (accept $\dfrac{14}{45} \times \dfrac{31}{45}$ or $\dfrac{27}{80} \times \dfrac{53}{80}$ or $\dfrac{9}{25} \times \dfrac{16}{25}$)
			A1	for $\dfrac{2}{9}$ oe

Paper: 1MA1/3F				
Question	**Working**	**Answer**	**Mark**	**Notes**
27		$x = 1.5$, $y = 3.5$	M1	for correct method to eliminate one variable (condone one arithmetic error)
			M1	(dep) for substituting found value in one of the equations or correct method after starting again (condone one arithmetic error)
			A1	for both $x = 1.5$ and $y = 3.5$

Question 20

London	1.089 × 1.46 = $1.58(9..) per litre	→	1.589... × 3.785 = $6.01(7..) per gallon
	1.089 × 3.785 = £4.12(1..) per gallon	→	4.121... × 1.46 = $6.01(7..) per gallon
New York	2.83 ÷ 1.46 = £1.93(8..) per gallon	→	1.938... ÷ 3.785 = £0.51(2..) per litre
	2.83 ÷ 3.785 = $0.74(7..) per litre	→	0.747... ÷ 1.46 = £0.51(2..) per litre

The table shows the most commonly used approaches. There are of course other approaches that can be used.

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

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: ±5°
Measurements of length: ±5 mm

PAPER: 1MA1_3F			
Question		**Modification**	**Mark scheme notes**
6		Diagram enlarged. Key moved above and to the left of the diagram. Question wording changed: 15 changed to 14 so that candidates only have to draw half a circle instead of three quarters of a circle. The bike wheels have been replaced by a circle. Braille only: will have one horizontal line and one vertical line separating the circle into 4 sections. Braille will also add one whole circle in the key.	Standard mark scheme but now 3 ½ circles for Saturday. Note the simplification of the key for Braille. Accept a key drawn with quarter circles instead of the full bicycle wheel
7		Diagram enlarged. Angles moved outside of the angle arcs and the angle arcs made smaller. Braille only: will add information about the diagram.	Standard mark scheme
8		Diagram enlarged x3 exactly and simplified	Standard mark scheme
13	(a)	Wording added 'There are four spaces to fill.' Table turned to vertical format. Wording added 'below.'	Standard mark scheme
	(c)	Diagram enlarged.	Standard mark scheme with additional tolerance on reading off.

Question	Modification	Mark scheme notes
14	Diagram enlarged. Wording added 'It shows shape A and shape B given on a grid.' x axis changed to go from -2 to 8. Shape A moved to (2, 3) (2, 1) (6, 3) (6, 2). Shape B move to (2, -1) (2, -3) (6, -2) (6, -3).	Standard mark scheme

15	Wording added 'There are seven spaces to fill.' Table turned to vertical format.
	                    Braille: will label the answer spaces:
	                    Cotton fabric Silk fabric
	      2m £6 (i)
	      6m (ii) (iii)
	      8m (iv) (v)
	      9m (vi) (vii)
		Standard mark scheme

16	Model provided for all candidates. Diagram enlarged and also provided for MLP. Information left aligned.	Standard mark scheme
18	Diagram enlarged. Diagram labels moved to the left of the diagrams. Diagrams have been stacked vertically.	Standard mark scheme
19	Numbers in the table have changed to: 130-140: **5**; 140-150: **10**; 150-160: **20**; 160-170: **30**; 170-180: **15** In part (b) Diagram enlarged. Right axis has been labelled. Axes labels moved to the left of the horizontal axis and above the vertical axis. Vertical axis extended so it goes up to 35.	Standard mark scheme with the amendment: Line segments joining the points (135, 5), (145, 10), (155, 20), (165, 30) and (175, 15)
24	Diagram enlarged. Wording added 'Diagram (i) shows'. Shape labelled as 'Diagram (i)'. Wording added 'Diagram (ii)' after '8-sided shape,' Shape labelled as 'Diagram (ii)'.	Standard mark scheme