



Mark Scheme (Results)

Predicted Paper 1- Set 1

Edexcel-style GCSE

In Mathematics (PA-1MA1/1F)

Foundation (Non-Calculator) Paper 1F

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: PA-1MA1/1F				
Question	Answer	Mark	Mark Scheme	Additional guidance
1 (a)	3/4	B1	3/4 oe fraction, e.g. 75/100	Accept any equivalent fraction; simplest form not required
1 (b)	0.45	B1	0.45 cao	—
2	22.5	B1	22.5 (km) cao	22500 ÷ 1000
3 (a)	$y^2 - 14y$	B1	$-14y + y^2$ oe, e.g. $y^2 - 14y$	Both terms required; accept terms in any order
3 (b)	$10z^2$	B1	$10z^2$ cao	—
3 (c)	6cd	B1	6cd oe, e.g. 6dc	From $c \times d \times 4 + 2 \times c \times d = 4cd + 2cd$; accept like terms in any order
4 (a)	50	B1	50(°) cao	From 180 – 130 (angles on a straight line). 1-mark item: all-or-nothing, no method-only credit.
4 (b)	Yes (isosceles) with a valid reason	C1	Yes (isosceles) with a correct reason referring to two equal angles or two equal sides, e.g. "angle ABC = angle ACB = 50°, so two angles are equal, therefore isosceles"	ft their angle ACB from (a): award if the conclusion is consistent with their ACB together with angle ABC = 50°. "Yes" with no reason scores C0. Do not accept a contradictory or ambiguous statement (e.g. "two equal angles so all three sides are equal"). Acceptable: "Yes, angles ABC and ACB are both 50° so two angles are equal"; "Yes, two equal angles (50° and 50°) so two equal sides"; "Yes, the base angles are equal so it is isosceles". Not acceptable: "Yes" (no reason); "Yes, it looks isosceles / it is symmetrical"; "Yes, because all the angles are 50°"; "Yes, because all three sides are equal" (describes an equilateral triangle).

Paper: PA-1MA1/1F				
Question	Answer	Mark	Mark Scheme	Additional guidance
5 (a)	7643	B1	7643 cao	—
5 (b)	60	B1	An arrangement giving 60, e.g. $26 + 34$ or $24 + 36$ (two-digit numbers with tens digits 2 and 3)	Each card may be used once only — do not accept arrangements that reuse a digit (e.g. $23 + 37$ reuses the 3). Accept the answer 60 with a valid card arrangement shown.
6	2	B1	2, from rounding to $(12 \div 4) - 1$ oe	Accept answers from suitable rounding, e.g. $12 \div 4 = 3$ then $3 - 1 = 2$; rounding must be to 1 sig fig or sensible values
7 (a)	root	B1	root	—
7 (b)	expression	B1	expression	—
8 (a)	80	M1	Method to find number of balloons, e.g. $20 \div 0.25$ oe or $2000 \div 25$ or build-up (4 balloons per £1 $\rightarrow 4 \times 20$)	—
8 (a)		A1	80 cao	—
8 (b)		M1	Method to find number of stickers, e.g. $3.75 \div 0.15$ oe or $375 \div 15$	—
8 (b)		A1	25 cao	—
9	Red = 0.12, Blue = 0.6, Orange = 0.2	M1	Setting up the relationships, e.g. $P(B) = 5 \times P(R)$ and $P(B) = 3 \times P(O)$, or $P(R) = P(B)/5$ and $P(O) = P(B)/3$	—
9		M1	Using the fact that probabilities sum to 1, e.g. $0.08 + P(B)/5 + P(B) + P(B)/3 = 1$ oe, or $23/15 \times P(B) = 0.92$	—
9		A1	All three correct: 0.12, 0.6, 0.2	Accept equivalent fractions. A1 ft: award for three values consistent with a correctly found $P(B)$, or for a correct $P(B) = 0.6$ with one downstream arithmetic slip. Check the four probabilities sum to 1.

Paper: PA-1MA1/1F				
Question	Answer	Mark	Mark Scheme	Additional guidance
10	15 : 5 : 3	M1	Method to link the scores, e.g. Janice = $5 \times$ Ruth and Jane = Janice $\div 3$, or two correct partial ratios with a common term (Janice : Ruth = 5 : 1 = 15 : 3 and Janice : Jane = 3 : 1 = 15 : 5)	—
10		A1	15 : 5 : 3 oe in the order Janice : Jane : Ruth	Accept any equivalent ratio, e.g. 30 : 10 : 6; the order must be correct
11 (a)	Walk	B1	Walk (largest sector of the pie chart)	Identify the activity with the largest sector / greatest frequency as the mode. Accept "Walking".
11 (b)	13	B1	13, from $90/360 \times 52$ oe, e.g. $1/4 \times 52$	Bus sector is a right angle (90°)
12 (a)	(1, -2)	B1	(1, -2) cao	—
12 (b)	$x \approx 2.4$ and $x \approx -0.4$	B1	One root in an acceptable range: 2.3 to 2.5 or -0.5 to -0.3	—
12 (b)		B1	Both roots in the acceptable ranges, e.g. 2.4 and -0.4	Roots read from where the curve crosses the x-axis. Order of the two roots does not matter.
13 (a)	225	M1	Recognising inverse proportion, e.g. $(150 \times 6) \div 4$ oe or $900 \div 4$	—
13 (a)		A1	225 (minutes) cao	—
13 (b)	Valid assumption stated	C1	A correct assumption, e.g. all taps flow at the same (constant) rate, or each tap fills at the same rate throughout	Statement must relate to the rate of flow of the taps. Acceptable: "All taps flow at the same rate"; "Each tap fills at a constant rate the whole time"; "The taps do not affect each other's flow"; "No water leaks out / the pool starts empty". Not acceptable: "The taps work / the taps are on" (too vague); "The pool is big / the same size" (irrelevant to the proportion); "It takes a long time" (not an assumption); restating the question (e.g. "there are 4 taps").

Paper: PA-1MA1/1F				
Question	Answer	Mark	Mark Scheme	Additional guidance
14	1	P1	Process to find Peter's total, e.g. $75 + 30/100 \times 75 (= 97.50)$ oe, or the bonus $30/100 \times 75 (= 22.50)$	—
14		P1	Process to find Mia's total, e.g. $75 + 21.50 (= 96.50)$, and to find the difference between the two totals	—
14		A1	(£)1 oe, e.g. 1.00	Alternative: difference between bonus and tips, $22.50 - 21.50 = 1$, scores full marks with a complete method
15 (a)	26%	M1	Method to find percentage increase, e.g. $(1575 - 1250)/1250 \times 100$ oe or $325/1250 \times 100$	—
15 (a)		A1	26(%) cao	—
15 (b)		P1	Process to find students per teacher for one school in 2020, e.g. $1575 \div 90 (= 17.5)$ or $396 \div 24 (= 16.5)$	—
15 (b)		P1	Process to find students per teacher for both schools, with figures to compare	—
15 (b)		C1	School X with correct comparable figures 17.5 and 16.5	Award 0 marks for a correct answer with no supporting working
16	10	B1	10 cao	Derivation: $8 \times 5/4$. (No further marking guidance applies — single-mark, answer-only item.)
17	Packet 1 (supported)	P1	Process to find a comparable unit value for at least one packet, e.g. price per chocolate $10.50 \div 35 (= 0.30)$, $27.00 \div 60 (= 0.45)$ or $36.00 \div 80 (= 0.45)$; or chocolates per pound; or scaling to a common number of chocolates	—
17		P1	Process to find comparable values for all three packets, e.g. 0.30, 0.45 and 0.45 (price per chocolate)	—
17		C1	Packet 1 with correct supporting figures ($0.30 < 0.45 = 0.45$)	Award 0 marks for a correct answer with no supporting working. "Packet 1" named without the supporting figures scores C0. Allow a ft conclusion drawn correctly from the candidate's own three comparable values.

Paper: PA-1MA1/1F				
Question	Answer	Mark	Mark Scheme	Additional guidance
18 (a)	Kite (identified and drawn)	B1	Kite named	—
18 (a)		B1	A correct sketch of a kite with two pairs of adjacent equal sides indicated and one pair of equal (opposite) angles	Sketch need not be accurate; equal sides/angles should be indicated or implied
18 (b)		B1	1 / one line of symmetry	—
19 (a)	$x > 8$	M1	A correct first step, e.g. collecting terms $6 + 10 < 6x - 4x$ or $16 < 2x$, or finding the critical value 8	Final answer must be an inequality in the correct direction
19 (a)		A1	$x > 8$ oe, e.g. $8 < x$	—
19 (b)	4, 5, 6, 7, 8	M1	A correct method to solve one inequality, e.g. $c > 3$ or $c < 9$, or $3 < c < 9$ stated	—
19 (b)		A1	4, 5, 6, 7, 8 all listed, no extras	—
20 (a)	640	P1	Identifying syrup as the limiting ingredient, e.g. $300 \div 3 (= 100)$ and comparing with $400 \div 5 (= 80)$, or scaling the ratio $5 : 3 = 400 : 240$	—
20 (a)		P1	A complete method to find the total amount, e.g. $400 + 240$ or $80 \times (5 + 3)$ oe	Syrup is the limiting factor: 400 ml syrup allows only 240 ml milk
20 (a)		A1	640 (ml) cao	—
20 (b)	Yes, with reason	C1	Yes, with correct supporting figures, e.g. milk is now the limiting ingredient: 150 ml milk allows 250 ml syrup, so the maximum is 400 ml, a decrease from 640 ml	"Yes" without valid figures or reasoning scores C0
21	216	B1	216 cao	$6 \times 6 \times 6$
22	2	M1	Method to find the mean, e.g. $(0 \times 1 + 1 \times 6 + 2 \times 7 + 3 \times 4 + 4 \times 2) \div (1 + 6 + 7 + 4 + 2)$, i.e. $40 \div 20$	At least 3 correct products required for the method mark; condone one arithmetic error
22		A1	2 cao	—

Paper: PA-1MA1/1F				
Question	Answer	Mark	Mark Scheme	Additional guidance
23 (a)	Test A branches: 0.6, 0.4; all Test B branches: 0.5	B1	0.6 and 0.4 correctly placed on the Test A branches	—
23 (a)		B1	0.5 on all four Test B branches	—
23 (b)	0.8 shown	M1	A correct method, e.g. $0.6 \times 0.5 + 0.6 \times 0.5 + 0.4 \times 0.5$ oe, or $1 - P(\text{fail both}) = 1 - 0.4 \times 0.5$	fit the candidate's tree values from part (a): award for a correct method applied to their probabilities
23 (b)		A1	Complete working leading to 0.8, e.g. $0.3 + 0.3 + 0.2 = 0.8$ or $1 - 0.2 = 0.8$	Since the answer is given, all stages of working must be shown
24	$x = -4, y = 6$	M1	A correct method to eliminate one variable, e.g. multiplying $x + 4y = 20$ by 2 and subtracting to give $5y = 30$, or substituting $x = 20 - 4y$ into $2x + 3y = 10$	Condone one arithmetic error
24		A1	One correct value, $x = -4$ or $y = 6$	—
24		A1	Both $x = -4$ and $y = 6$	If no working shown, both values correct scores full marks; one value correct with no working scores 0
25 (a)	120	M1	Reading $AB = 6$ cm and $BC = 6$ cm from the grid and using the scale, e.g. $6 \times 10 + 6 \times 10$ or $(6 + 6) \times 10$	—
25 (a)		A1	120 (m) cao	—
25 (b)		M1	A correct method, e.g. $\tan(CAB) = 6/6 (= 1)$ so $CAB = \tan^{-1}(1)$, or recognising the triangle is right-angled and isosceles so base angles are $(180 - 90) \div 2$	—
25 (b)		A1	45(°) cao	—
26	$2 \times 3^3 \times 7$	M1	A complete method to find prime factors, e.g. a complete factor tree or repeated division by primes with no more than one error, giving 2, 3, 3, 3, 7	Condone inclusion of 1 for the method mark
26		A1	$2 \times 3^3 \times 7$ oe, e.g. $2 \times 3 \times 3 \times 3 \times 7$	Product form required; a list of factors alone scores M1 only. The final answer must multiply back to 378.

Paper: PA-1MA1/1F				
Question	Answer	Mark	Mark Scheme	Additional guidance
27	Column vector: top $-3b$, bottom 2a (i.e. $-3b$ over 2a)	B1	One component correct in a column vector, i.e. top entry $-3b$ or bottom entry 2a	—
27		B1	Fully correct column vector: top $-3b$, bottom 2a	Left = negative x-component; up = positive y-component
28	$z = 6$	M1	A correct first step, e.g. $-10z = -40 - 20$ or $-10z = -60$ or $20 + 40 = 10z$	—
28		A1	$z = 6$ cao	—
29	164000	M1	Method to find the expected number, e.g. $1/5 \times 820000$ oe or $820000 \div 5$	—
29		A1	164000 cao	—
30 (a)	8	P1	Process to use volume of a prism, e.g. area of cross-section $\times 12 = 192$, or area of cross-section $= 192 \div 12 (= 16)$	—
30 (a)		P1	Process to use the area of a triangle, e.g. $\frac{1}{2} \times BC \times 4 = 16$ oe, or $\frac{1}{2} \times BC \times 4 \times 12 = 192$	—
30 (a)		A1	8 (cm) cao	—
30 (b)	45	M1	A correct method, e.g. $BD = 8 \div 2 = 4$ so $BD = AD = 4$, hence triangle ABD is right-angled and isosceles, leading to angle $ABC = (180 - 90) \div 2$; or $\tan(ABC) = 4/4$	ft their BC from part (a)
30 (b)		A1	45(°) cao	—