Mark Scheme (Results)

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Pearson Edexcel International GCSE
Mathematics B (4MB0/01R) Paper 1R

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.

- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.

- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.

- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.

- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.

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

- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.

- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.

- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

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

- **Abbreviations**
    - awrt – answers which round to…..
    - cao – correct answer only
    - ft – follow through
    - isw – ignore subsequent working
    - SC - special case
    - oe – or equivalent (and appropriate)
    - dep – dependent
    - indep – independent
    - eeoo – each error or omission

- **No working**

  If no working is shown then correct answers normally score full marks.

  If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **With working**

  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

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

  Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

  If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

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

- **Follow through marks**

  Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, 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.

- **Ignoring subsequent work**

  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Probability**

  Probability answers must be given a fractions, percentages or decimals. 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 answer is given on the answer line using both incorrect and correct notation, award the marks.

  If a probability fraction is given correctly then cancelled incorrectly, then isw (i.e. ignore the incorrectly cancelled answer).

- **Linear equations**

  Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated 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.

- **Parts of questions**

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

Question Number	Answer	Notes	Mark
1(a)	18°	Accept if marked on diagram	B1
(b)	$(56+"18")°$	ft from their answer to (a)	B1ft
		Total 2 marks	

Question Number	Answer	Notes	Mark
2	729 + 1296 (=2025)		M1
	45		A1
		Total 2 marks	

Question Number	Answer	Notes	Mark
3	$105 \times \dfrac{7}{5}$ (oe)		M1
	147		A1
		Total 2 marks	

Question Number	Answer	Notes	Mark
4	$2a(c-2d)+b(c-2d)$ OR $c(2a+b)-2d(2a+b)$		M1
	$(2a+b)(c-2d)$		A1
		Total 2 marks	

Question Number	Answer	Notes	Mark
5	$18t^2$ OR $-30t$	B1 for either value	B1
	$18t^2-30t$	Award a second B1 for both values given. Do not isw	B1
		Total 2 marks	

Question Number	Answer	Notes	Mark
6(a)	15		B1
(b)	100		B1
		Total 2 marks	

Question Number	Answer	Notes	Mark
7	20 + 15 − 6 (accept in a Venn diagram e.g. 14,6,9)		M1
	29		A1
		Total 2 marks	

Question Number	Answer	Notes	Mark
8	$\left(\dfrac{1}{2}\right)^3$ or 2^3 seen (o.e.)		B1
	30		B1
			Total 2 marks

Question Number	Answer	Notes	Mark
9	$2 \times 5 - 3p = 4$ OR $p = \dfrac{2 \times 5 - 4}{3}$	*Note: Accept y for p*	M1
	$p = 2$	*Note: Accept y for p*	A1
			Total 2 marks

Question Number	Answer	Notes	Mark
10	$(2x-1)(x+6)$ (2 correct terms in expansion) OR $\dfrac{-11 \pm \sqrt{11^2 - 4(2)(-6)}\left(=\sqrt{169}=13\right)}{2 \times 2}$		M1
	$\dfrac{1}{2}$, -6		A1,A1
			Total 3 marks

Question Number	Answer	Notes	Mark
11(a)	a, d **NB:** Accept $2^{-1}, \left(\dfrac{1}{8}\right)^{\frac{1}{3}}$		B1,B1
(b)	e **NB:** Accept $\left(\dfrac{1}{4}\right)^{-2}$		B1
			Total 3 marks

Question Number	Answer	Notes	Mark
12	$\dfrac{50}{0.5036}$ (o.e.) OR $\$82 = £82 \times 0.5036 \ (=£41.2952)$		M1
	"99.2851" – 82 OR $\dfrac{£50 - £41.2952 \left(= £8.7048\right)}{0.5036}$		M1 dep
	17.28/17.29		A1
		Total 3 marks	

Question Number	Answer	Notes	Mark
13	$28 - 4x \leqslant 9$ OR $7 - x \leqslant \dfrac{9}{4}$		M1
	19/4 (=4.75) ≤ x		M1dep
	(x =) 5		A1
		Total 3 marks	

Question Number	Answer	Notes	Mark
14(a)	$\begin{pmatrix} x^2 & 0 \\ 0 & x^2 \end{pmatrix}$	B2 (-1 for each error)	B2
(b)	$x = 3$ (or -3)	Accept ±3	B1
		Total 3 marks	

Question Number	Answer	Notes	Mark
15(a)	$y = \dfrac{12-2x}{3}$ OR $y = -\dfrac{2}{3}x + \dfrac{12}{3}$ OR Correct $\dfrac{y_2 - y_1}{x_2 - x_1}$ statement (inc. subst) eg $\dfrac{0-4}{6-0}$		M1
	$-\dfrac{2}{3}$ OR 0.667(or better)		A1
(b)	(0, 4) Allow $x = 0, y = 4$ as an answer	Award B0 if no brackets seen	B1
			Total 3 marks

Question Number	Answer	Notes	Mark
16(a)	one term correctly differentiated		M1
	$8x + \dfrac{1}{x^2}$ or $8x + x^{-2}$		A1
(b)	$8x^3 + 1 = 0$ (but must have removed denominators from their expressions correctly)		M1
	$x = -\dfrac{1}{2}$		A1
			Total 4 marks

Question Number	Answer	Notes	Mark
17	$(13)^2 - 5^2$ OR $52 + (x + 9)^2 = 132$ $[x^2 + 18x - 63 = (x-3)(x + 21)]$ OR $\sin \angle BFX = \dfrac{5}{13}$		M1
	$CX = x = 3$		A1
	$10 \times "3" = 5 \times XE$ (correct intersecting chords statement)		M1indep
	$XE = 6$ cm		A1
			Total 4 marks

Question Number	Answer	Notes	Mark
18	$(2n-4)\times 90 = 2340$ $n - 2 = 13$		M1
	$n = 15$		A1
	$\dfrac{360}{"15"}$ or $180 - \dfrac{2340}{"15"}$		M1 dep
	24		A1
	Special Case: $\dfrac{360}{13}$ scores M1 A0 M1 A0		
		Total 4 marks	

Question Number	Answer	Notes	Mark
19(a)	$\begin{pmatrix} -8 \\ 15 \end{pmatrix}$		B1,B1
	SC: $\begin{pmatrix} 8 \\ -15 \end{pmatrix}$ with, or without working B1, B0		
(b)	$\sqrt{("-8")^2 + "15"^2}$		M1
	17		A1ft
		Total 4 marks	

Question Number	Answer	Notes	Mark
20(a)	$\dfrac{44.73}{1.42}$		M1
	31.5 litres		A1
(b)	$\dfrac{"31.5"}{0.9}$		M1
	35 litres		A1
		Total 4 marks	

Question Number	Answer	Notes	Mark
21	$3 = \dfrac{k}{4^2}$		M1
	$k = 48$ OR $3 \times 4^2 = y \times 8^2$ scores M1, A1		A1
	$y = \dfrac{"48"}{8^2}$		M1dep
	$\dfrac{3}{4}$ OR 0.75		A1
		Total 4 marks	

Question Number	Answer	Notes	Mark
22(a)(i)	$4\sqrt{2}$		B1
(ii)	$6\sqrt{2}$		B1
(b)	$3 \times "6"\sqrt{2} - 3 \times 3 + "4"\sqrt{2} \times "6"\sqrt{2} - 3 \times "4"\sqrt{2}$		M1
	$\left(= 18\sqrt{2} - 9 + 24 \times 2 - 12\sqrt{2}\right)$		M1(dep)
	$c = 39$ and $d = 6$ **NB:** $39 + 6$ scores A1	Correct answer given but no working seen scores M1 M0 A1	A1
		Total 5 marks	

Question Number	Answer	Notes	Mark
23(a)	$4 \times 5 \times 1.8 \times 10^{-4}$		M1
	Any correct statement involving a mantissa and exponent e.g. 36×10^{-4}		A1
	3.6×10^{-3}		A1
(b)	$\dfrac{0.9}{1.8 \times 10^{-4}}$		M1
	5000		A1
		Total 5 marks	

Question Number	Answer	Notes	Mark
24(a)	construction of perpendicular bisector of *CD*		B1
	accuracy		B1
(b)	construction of bisector of $\angle BAD$		B1
	accuracy		B1
(c)	9.1 cm $(\pm 0.1\ \text{cm})$		B1
		Total 5 marks	

Question Number	Answer	Notes	Mark
25(a)	6		B1
(b)	$\dfrac{5+6}{2}$		M1
	5.5		A1
(c)	166 (= 2x3 + 4x5 + 5x8 + 6x9 + 7x3 + 8x2 + 9x1)		M1
	$\dfrac{"166"}{30}$		M1INDEP
	5.53 (awrt)		A1
		Total 6 marks	

Question Number	Answer	Notes	Mark
26(a)	-10 (allow $x \neq -10$)		B1
(b)	1.6, $\dfrac{8}{5}$		B1
(c)	$5\left(2 - \dfrac{3}{x+10}\right) - 4$		M1
	$6 - \dfrac{15}{x+10}$ or $\dfrac{6x+45}{x+10}$ or $\dfrac{3(2x+15)}{x+10}$		A1
(d)	" $6(x+10) - 15 = 3(x+10)$ " (remove fractions)		M1
	$x = -5$		A1
		Total 6 marks	

Question Number	Answer	Notes	Mark
27(a)	12 45 50 40	B1 for each correct value in the correct place.	B1,B1 B1,B1
(b)	$\dfrac{"45"}{225} \times 100$		M1
	20%		A1
	Special Case: If answer of 6, 45, 25, 10 is seen in part (a) then award B0 B1 B0 B0 as only one correct value in correct place In part (b), this would then lead to a calculation of = 47.11% so award M1 A0		
		Total 6 marks	

Question Number	Answer	Notes	Mark
28	*Penalise answers not corrected to 3 SF once only in the question, the first time it occurs. Do NOT penalise multiple times.*		
(a)	$\dfrac{30}{AD} = \sin 40$		M1
	46.7 (m)		A1
(b)	$\tan DCB = \dfrac{30}{45}$		M1
	33.7°		A1
(c)	$\tan ACB = \dfrac{30/\tan 40}{45}$		M1
	$\angle ACB = 38.5°$		A1
	$360 - "38.5"$ Awrt 322 (321.5)		A1ft
		Total 7 marks	
	TOTAL FOR PAPER = 100 MARKS		