Mark Scheme (Results)

Summer 2022

Pearson Edexcel Level 2 Award
In Algebra (AAL20)
Paper 01

NOTES ON MARKING PRINCIPLES

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

2   Abbreviations

cao – correct answer only	ft – follow through
isw – ignore subsequent working	SC: special case
oe – or equivalent (and appropriate)	dep – dependent
indep - independent	

3   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.

4   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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
If there is no answer on the answer line then check the working for an obvious answer.
Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.
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.

5 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.

6 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: e.g. 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 e.g. algebra.

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

7 Parts of questions

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

8 Use of ranges for answers

If an answer is within a range this is inclusive, unless otherwise stated.

Question		Working	Answer	Mark	Notes
1	(a)		$4d$	1	B1 for $4d$
	(b)		$8w^3$	2	M1 for 8 or w^3 correct in a product A1 for $8w^3$
	(c)		p^8	1	B1 for p^8
	(d)		h^4	1	B1 for h^4
	(e)		$125t^6$	2	M1 for 125 or t^6 correct in a product A1 for $125t^6$
2			D, A, C, B, E	3	B3 diagrams may be annotated (B2 for 3 or 4 correct B1 for 2 correct)
3	(a)		$m(m + 1)$	1	B1 for $m(m + 1)$
	(b)		$3xy(2x - 3y)$	2	B2 for $3xy(2x - 3y)$ (B1 for correct partial factorisation with 3 factors, $3x(2xy - 3y^2)$, $3y(2x^2 - 3xy)$, $xy(6x - 9y)$)

Question		Working	Answer	Mark	Notes
4	(a)		7	2	M1 for a correct first step, subtracting 3 from both sides or dividing throughout by 2 A1 cao
	(b)		18	2	M1 for adding 1 to both sides or multiplying throughout by 3 A1 cao
	(c)		–4	3	M1 for multiplying out the bracket or dividing both sides by 5 M1 for isolating terms in x A1 for –4
5	(a)		30, 90, 270	2	M1 for multiplication of a term by 3 to obtain the next term A1 for 30, 90, 270
	(b)		$-2n + 11$	2	M1 for $-2n \ (+ c)$ A1 for $-2n + 11$ oe
6	(a)		$14p + 21$	2	M1 for 1 out of 2 terms correct A1 for $14p + 21$
	(b)		$15q^2 - 6q^3$	2	M1 for 1 term out of 2 terms correct A1 $15q^2 - 6q^3$
7			Formula Equation Formula Expression	3	B3 all correct answers (B2 for 3 correct answers B1 for 1 or 2 correct answers)

Question		Working	Answer	Mark	Notes
8	(a)		175	1	B1 cao
	(b)		50	2	M1 for method to work with speed for the correct section of the graph eg $\frac{75}{90}$ or $\frac{75}{1.5}$ A1 cao
	(c)		1315	1	B1 oe (allow 1313 to 1317)
	(d)		Line drawn	1	B1 for line drawn from (1100, 175) to (1200, 175)

9						Straight line from (−3, −4) to (3, 8)	3	**(Table of values)** M1 for a correct method to find at least 2 points by substituting values of x

x	−3	−2	−1	0
y	−4	−2	0	2

x	1	2	3
y	4	6	8

OR

Using $y = mx + c$

gradient = 2
y intercept = 2

(Table of values)
M1 for a correct method to find at least 2 points by substituting values of x
M1 (dep) ft for plotting at least 2 of their points (any points plotted from their table must be correctly plotted)
A1 for correct line between $x = -3$ and $x = 3$

(No table of values)
M2 for at least 2 correct points and no incorrect points plotted OR line segment of $y = 2(x + 1)$ drawn (ignore any additional incorrect segments)
(M1 for at least 3 correct points with no more than 2 incorrect points)
A1 for correct line between $x = -3$ and $x = 3$

(Use of $y = mx + c$)
M2 line segment of $y = 2(x + 1)$ drawn (ignore any additional incorrect segments)
(M1 for line drawn with gradient of 2 OR line drawn with y intercept of 2 and a positive gradient)
A1 for correct line between $x = -3$ and $x = 3$

SC B1 for no line drawn but clearly states gradient = 2 and y intercept = 2

Question		Working	Answer	Mark	Notes
10	(a)		Integer less than -3	1	B1 for 1 correct value and no incorrect values
	(b)		$-3 < y \leq 2$	2	B2 for $-3 < y \leq 2$ (B1 for $-3 < y$ or $y \leq 2$) **NB** Accept the use of any letter other than y and ignore attempts to list integer values
	(c)		Correct diagram	2	B2 fully correct answer (B1 for an open circle drawn at 0 and a continuous line drawn to the left **or** for a filled in circle at 0)
	(d)		$w < 1.5$	2	M1 for isolating terms in w or for a critical value of 1.5 A1 oe

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Question	Working	Answer	Mark	Notes
11		Sketch	3	B1 for general shape (parabola with correct orientation in all four quadrants) B1 for symmetry about y-axis B1 for y intercept labelled at $(0, -3)$
12 (a)		$3x$	1	B1 for $3x$ oe
(b)		$5x + 5$	2	M1 for adding at least two of x, $3x$, $x + 5$ A1 for $5x + 5$ or $5(x + 1)$
(c)		$2x - 5$	2	M1 for $3x - (x + 5)$, ft part (a) A1 cao

Question		Working	Answer	Mark	Notes
13	(a)		8.6	1	B1 cao
	(b)		2055	1	B1 (accept 2056)
	(c)		3.4	2	M1 for correct method to find the difference with at least 1 correct reading, eg 11.2 – 7.8 A1 for 3.4
	(d)		2020 to 2040	1	B1 for period 2020 – 2040, may be expressed in different ways

Question		Working	Answer	Mark	Notes
14	(a)		14	2	M1 for substituting $v = 10$, may be seen in working or in flow chart A1 cao
	(b)		4	3	M1 for substitution of 5 eg $5 = \frac{3v}{2} - 1$ **or** for $d + 1 = \frac{3v}{2}$ M1 for a first step to solve the equation, eg $5 + 1 = \frac{3v}{2}$ **or** for $\frac{2(d+1)}{3} = v$ A1 cao
	(c)		$v = \frac{2(d+1)}{3}$	3	M1 for a first step to rearrange, eg $d + 1 = \frac{3v}{2}$ M1 for a second step, eg $2(d + 1) = 3v$ A1 oe
15	(a)		−5, 0, (3), (4), 3, 0, −5	2	B2 for all 5 missing values correct (B1 for 3 or 4 missing values correct)
	(b)		Curve drawn	2	M1 (dep B1) for plotting their points A1 for correct curve between $x = -1$ and $x = 5$
	(c)		0.5 to 0.6 and 3.4 to 3.5	2	M1 for using $y = 2$, may be shown on graph or one correct value ft their quadratic curve A1 for one value between 0.5 to 0.6 and one value between 3.4 to 3.5 or ft their quadratic curve

Question	Working	Answer	Mark	Notes
16		$-\dfrac{3}{2}$	3	M1 for correct first step, eg $12x + 3 = 5 \times 2x$ M1 for isolating terms in x eg $12x - 10x = -3$ A1 for $-\dfrac{3}{2}$ oe
17 (a)		$\dfrac{2}{3}$	2	M1 for correct method to find the gradient eg sight of right-angled triangle with their height divided by their base using scale correctly A1 oe
(b)		$y = \dfrac{2}{3}x + 4$	2	M1 for using gradient from (a) in $y = mx + c$ or $y = \dfrac{2}{3}x + c$ oe, where $c \neq 4$ or $y = mx + 4$ oe where $m \neq 0, \dfrac{2}{3}$ or $\dfrac{2}{3}x + 4$ oe A1 ft using gradient from (a)

Question 15