



Pearson
Edexcel

Mark Scheme (Results)

January 2023

Pearson Edexcel Awards
In Algebra (AAL20) Paper 01

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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

isw – ignore subsequent working

oe – or equivalent (and appropriate)

indep - independent

ft – follow through

SC: special case

dep – dependent

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

AAL20_01 January 2023 Level 2

Question		Working	Answer	Mark	Notes
1	(a)		p^7	1	B1
	(b)		w^3	1	B1
	(c)		t^8	1	B1
	(d)	$n^2 - 3n + 10n + 2n^2$	$3n^2 + 7n$	3	M1 for correctly expanding either bracket, eg $n^2 - 3n$ or $10n + 2n^2$ M1 for correctly expanding both brackets, eg $n^2 - 3n$ and $10n + 2n^2$ A1 for $3n^2 + 7n$
2	(a)		6	2	M1 for a correct first step, subtracting 4 from both sides or dividing throughout by 5 A1 cao
	(b)		$\frac{15}{2}$	2	M1 for a correct first step, multiplying throughout by 3 or dividing throughout by 2 A1 for $\frac{15}{2}$ or $7\frac{1}{2}$ or 7.5
	(c)		-8	2	M1 for a correct first step, eg adding 6 to both sides or subtracting $4w$ from both sides A1 cao
3	(a)		35	1	B1 cao
	(b)		8, 12	1	B1 cao

AAL20_01 January 2023 Level 2

Question		Working	Answer	Mark	Notes
4	(a)(i)		22	1	B1 cao
	(ii)		11.5	2	M1 for (a)(i) $\div 2 + 4$ or fourth term = 15 A1 for 11.5 or $11\frac{1}{2}$ or $\frac{23}{2}$ or ft (a)(i)
	(b)		$6n + 1$	2	M1 for $6n (+ c)$ A1 for $6n + 1$ oe
5	(a)		$4x - 3y$	2	M1 for 1 out of 2 terms correct, working may be seen in separate areas A1 for $4x - 3y$
	(b)		$-3m^4 + 4m^3$	2	M1 for expanding the bracket to get $4m^4 - 4m^3$ or $-4m^4 + 4m^3$ or 1 term out of 2 terms correct A1 for $-3m^4 + 4m^3$
6			Tick in correct position	1	B1 for indication of the expression $\sqrt{a + 4}$
7	(a)		$-7, -5, -3, -1, 1$	2	B2 all 5 values correct (B1 for 3 or 4 correct values)
	(b)		Straight line from $(-4, -7)$ to $(12, 1)$	2	M1 (dep B1) for at least 4 of their points correctly plotted A1 fully correct graph

AAL20_01 January 2023 Level 2

Question		Working	Answer	Mark	Notes
8	(a)		$2(2p - 3e)$	1	B1
	(b)		$3f(4f - 3)$	2	B2 for $3f(4f - 3)$ (B1 for correct partial factorisation, $f(12f - 9)$, $3(4f^2 - 3f)$ may be seen in working.)
	(c)		$5a^2x(2 + 5x)$	2	B2 for $5a^2x(2 + 5x)$ (B1 for correct partial factorisation with at least 4 factors, eg $5a^2(2x + 5x^2)$, $5ax(2a + 5ax)$, $a^2x(10 + 25x)$, may be seen in working.)
9	(a)		$-2, -1, 0, 1, 2$	2	B2 cao (B1 for 4 correct values and not more than 1 incorrect value or for $-3, -2, -1, 0, 1$)
	(b)		$q \geq -3$	1	B1 for $q \geq -3$ or $-3 \leq q$ NB Accept the use of any letter other than q and ignore attempts to list integer values
	(c)		Correct diagram	2	B2 for correct diagram, line from -8 to 0 with empty circles at each end (must have correct endpoint notation) (B1 for line from -8 to 0 but not with correct end point notation or one end point fully correct with no contradiction)
	(d)		$x \geq 3.5$	2	M1 for isolating terms in x or for a critical value of 3.5 A1 oe

AAL20_01 January 2023 Level 2

Question		Working	Answer	Mark	Notes
10	(a)		$5t$	1	B1 for $5t$ oe
	(b)		$5t + 3$	1	B1 for $5t + 3$ oe or ft from (a)
	(c)		$T = 3m + 2p$	3	M1 for $3m$ or for $2p$ or for $T =$ linear expression in both m and p M1 for $3m + 2p$ oe A1 for $T = 3m + 2p$
11			Sketch	2	B2 for parabola with minimum point at $(0, 0)$ (B1 for general shape, parabola with correct orientation)
12	(a)(i)		5	2	M1 for substituting $n = 3$ A1 cao
	(ii)		8	2	M1 for substituting $m = -10$ and isolating terms in n eg $3n = 14 - -10$ A1 cao
	(b)		$n = \frac{14-m}{3}$	2	M1 for a first step to rearrange, eg $3n = 14 - m$ or $\frac{m}{3} + n = \frac{14}{3}$ A1 oe
	(c)(i)		10	2	M1 for $(k =) \sqrt{100}$ or for ± 10 A1 cao
	(ii)		18	2	M1 for $3^2 = \frac{d}{2}$ or for $d = 2k^2$ A1 cao

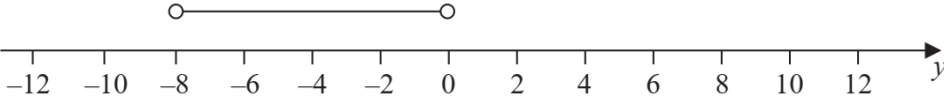
AAL20_01 January 2023 Level 2

Question		Working	Answer	Mark	Notes
13	(a)		10	1	B1 cao
	(b)		60	1	B1 cao
	(c)		40	1	B1 cao
	(d)		Graph drawn	2	B2 for fully correct graph (B1 for 1 line correct)
14	(a)		$y = \frac{2}{3}x$	2	M1 for complete method to find gradient, eg $\frac{8}{12}$ or gives equation in the form $y = cx$, $c \neq \frac{2}{3}$ A1 for $y = \frac{2}{3}x$ oe
	(b)(i)		Line drawn and labelled	1	B1 for line parallel to the y-axis drawn though (3, 0)
	(ii)		Line drawn and labelled	1	B1 for line drawn through points with coordinates of form (a, a)
15	(a)		8, (3), 0, -1, (0), 3, (8)	2	B2 for all 4 missing values correct (B1 for 2 or 3 missing values correct)
	(b)		Curve drawn	2	M1 (dep B1) for plotting their points A1 for correct curve between $x = -2$ and $x = 4$
	(c)		-1.6 to -1.7 and 3.6 to 3.7	2	M1 for using $y = 6$, may be shown on graph or for one correct value A1 for one value -1.6 to -1.7 and one value 3.6 to 3.7 or ft their curve (dep M1 in (b))

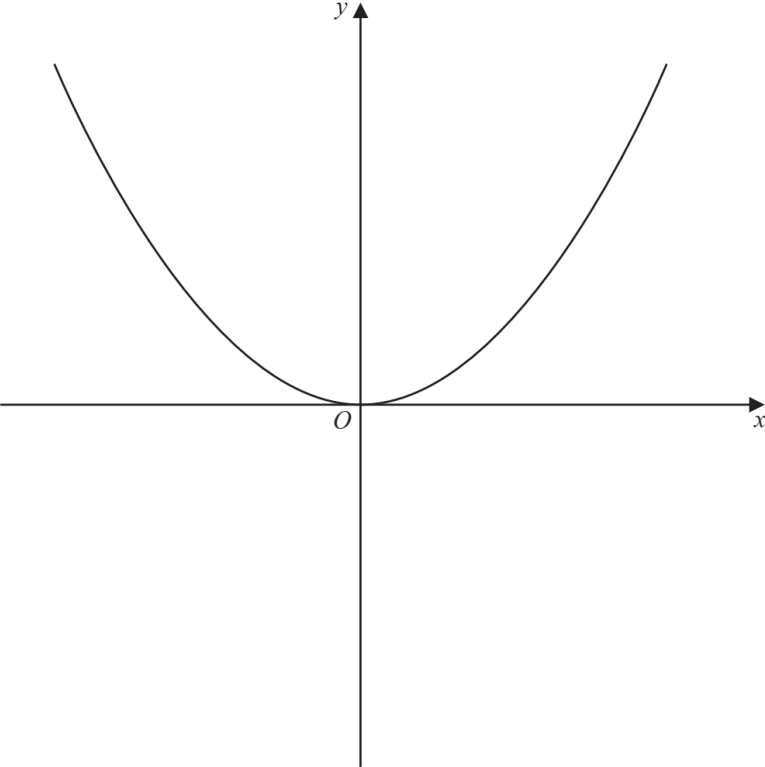
AAL20_01 January 2023 Level 2

Question		Working	Answer	Mark	Notes
16	(a)		36	2	M1 for a correct first step eg $\frac{x}{3} = 8 + 4$ or $x - 12 = 24$ A1 cao
	(b)		$\frac{1}{2}$	3	M1 for a correct first step eg $6y = 4 - 2y$ or $3y = 2 - y$ M1 for isolating terms in y , eg $8y = 4$ or $4y = 2$ or $2y = 1$ A1 for $\frac{1}{2}$ or 0.5
17	(a)		50	2	M1 for complete method to find gradient, eg $\frac{1000}{20} (= 50)$ A1 cao
	(b)		Number of grams needed per square metre	1	B1 for explanation, eg number of grams of seed needed per square metre of lawn oe

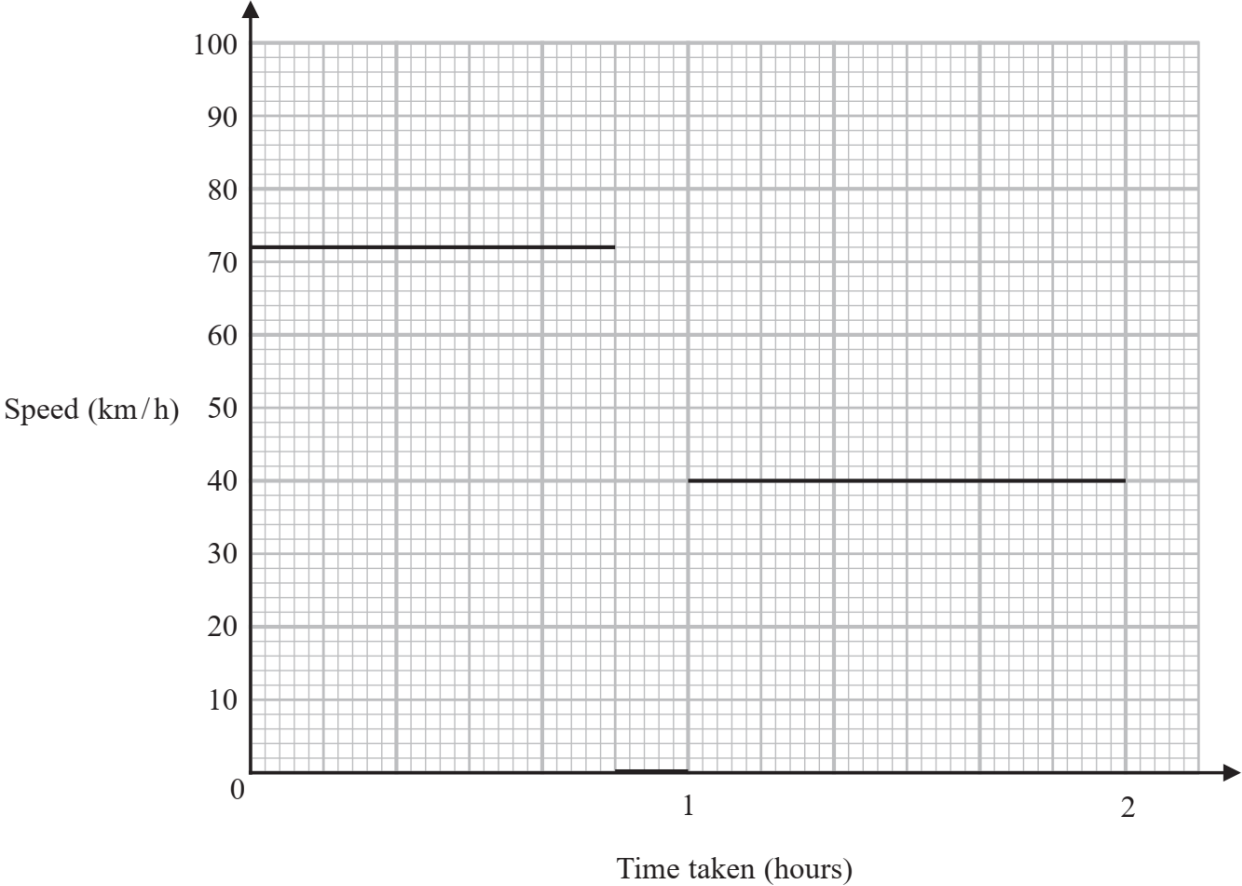
Question 9(c)



Question 11



Question 13(d)



Question 16

