Mark Scheme (Results)

Summer 2016

Pearson Edexcel Level 2 Award
in Algebra (AAL20)

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		$12st^2$	2	B2 for $12st^2$ or $12t^2s$ (B1 for two elements correct out of 3 elements in a product)
	(b)		P^8	1	B1 cao
	(c)		q^3	1	B1 cao
	(d)		$a = 16$ $n = 4$	2	M1 for $a = 16$ or $n = 4$ or $2w \times 2w \times 2w \times 2w$ A1 for $a = 16$ and $n = 4$
2	(a)		5	2	M1 for correct method to isolate terms in m on one side and constants on the other side. A1 cao
	(b)		-2	2	M1 for correct expansion of bracket or correct division of both sides by 2 A1 for -2

Question		Working	Answer	Mark	Notes
3	(a)		$4c + 6d$	2	B2 for $4c + 6d$ (B1 for one term correct)
	(b)		$2ut - 2u^2$	2	M1 for $2u \times t - 2u \times u$ or one correct term A1 for $2ut - 2u^2$
	(c)		$7m + 5$	2	M1 for correct expansion of one bracket or one correct term from two terms A1 for $7m + 5$
4	(a)(i)		16, 12	3	B1 cao
	(ii)		–80		M1 for $20 - 25 \times 4$ or $-4 \times 26 + 24$ A1 cao
	(b)	$5 \times 1 + 7$ $5 \times 2 + 7$	12, 17	2	M1 for substituting $n = 1$ or $n = 2$ into the expression $5n + 7$ A1 cao
	(c)		$3n + 2$	2	M1 for $3n \ (+ \ c)$ A1 for $3n + 2$ oe

PAPER: AAL20_01				
Question	**Working**	**Answer**	**Mark**	**Notes**
5 (a)		$6(2c + 1)$	2	B2 for $6(2c + 1)$ (B1 for correct partial factorisation)
(b)		$b(a - 5)$	1	B1 for $b(a - 5)$
(c)		$d(d - 1)$	1	B1 for $d(d - 1)$
6 (a)		$5x + 7$	2	M1 for $2x + 3x + 7$ A1 for $5x + 7$
(b)		$4x - 7$	2	M1 for $7x - (3x + 7)$ or "$9x$"$- 2x - (3x + 7)$ oe A1 for $4x - 7$
7 (a)		18	2	M1 for adding 2 to each side or multiplying all terms by 3 as first operation A1 cao
(b)		$\dfrac{9}{2}$	2	M1 for correct method to isolate terms in t on one side and constants on the other side. A1 for $\dfrac{9}{2}$ oe

Question	Working	Answer	Mark	Notes
8 (a)	x: −4, −3, −2, −1, 0, 1, 2, 3, 4 y: −6, −4, −2, 0, 2, 4, 6, 8, 10 OR Using $y = mx + c$ gradient = 2 y intercept = 2	Straight line from (−4, −6) to (4, 10)	3	**(Table of values)** M1 for at least 2 correct attempts to find 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 $x = -4$ and $x = 4$ **(No table of values)** M2 for at least 2 correct points and no incorrect points plotted OR line segment of $y = 2x + 2$ 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 $x = -4$ and $x = 4$ **(Use of $y = mx + c$)** M2 line segment of $y = 2x + 2$ 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 $x = -4$ and $x = 4$

The table of values in the Working column:

x	−4	−3	−2	−1	0	1	2	3	4
y	−6	−4	−2	0	2	4	6	8	10

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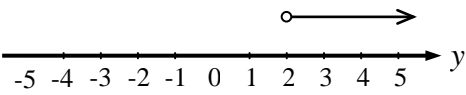| Question		Working	Answer	Mark	Notes
8	(b)(i)		–1	4	M1 for correct method to find the gradient eg sight of right angled triangle with their height divided by their base A1 cao
	(ii)		$y = -x + 3$		M1 for $y = -x + c$ or for $y = mx + 3,\ m \neq 0, -1$ ft m from b(i) A1 for $y = -x + 3$ oe ft m from b(i)
9	(a)		100	1	B1 cao
	(b)		15	2	M1 for method to find the gradient eg sight of right angled triangle with their height divided by their base A1 for 14 to 15
	(c)		Line drawn	2	M1 for plotting at least 2 points correctly (and not more than 1 incorrect point) A1 for correct and complete line
	(d)		3	1	B1 cao

Question	Working	Answer	Mark	Notes
10 (a)(i)		Correct sketch	3	B2 cao (B1 for general shape (parabola) through(0,0))
(ii)		Correct sketch		B1 for correct sketch or ft from parabola in (a)
(b)		Correct sketch with (0, 2) shown	2	B2 cao (B1 for parabola with correct orientation and with y axis as a line of symmetry)
11 (a)		60	2	M1 for correct method to find speed, eg 80 (km) $\div$ $1\frac{1}{3}$ (hours) A1 cao
(b)		correct line	1	B1 for line from (4.20, 80) to (4.40, 80)
(c)		completed graph	2	M1 for line representing the correct speed A1 cao to (5.20,100)

Question	Working	Answer	Mark	Notes
12 (a)(i)		9	6	M1 for correct substitution of $d = 12$ A1 cao
(ii)		40		M1 for 30×4 (=120) or $30 \div 3$ (=10) or $t \times 4 = 3d$ or $t \div 3 = \dfrac{d}{4}$ oe A1 cao
(iii)		$d = \dfrac{4t}{3}$		M1 for a correct first step eg $t \times 4 = 3d$ or $t \div 3 = \dfrac{d}{4}$ oe A1 for $d = \dfrac{4t}{3}$ oe
(b)(i)		4	3	B1 cao
(ii)		1		M1 for 3^2 (= 9) or $3 = \sqrt{9}$ A1 cao

Question	Working	Answer	Mark	Notes
13 (a)		$-2, -1, 0, 1, 2$	2	B2 cao (B1 for at least 4 correct (and no incorrect values), eg $-1, 0, 1, 2$ **or** one additional value, eg $-3, -2, -1, 0, 1, 2$)
(b)		$-2 \leq x \leq 4$	2	B2 for $-2 \leq x \leq 4$ (B1 for $x \geq -2$ or ≥ -2 or $x \leq 4$ or ≤ 4) **NB** Accept the use of any letter other than x and ignore attempts to list integer values
(c)		correct diagram	1	B1 cao
(d)		$n \leq 5$	1	B1 for $n \leq 5$
(e)		$m \leq -7$	1	B1 for $m \leq -7$

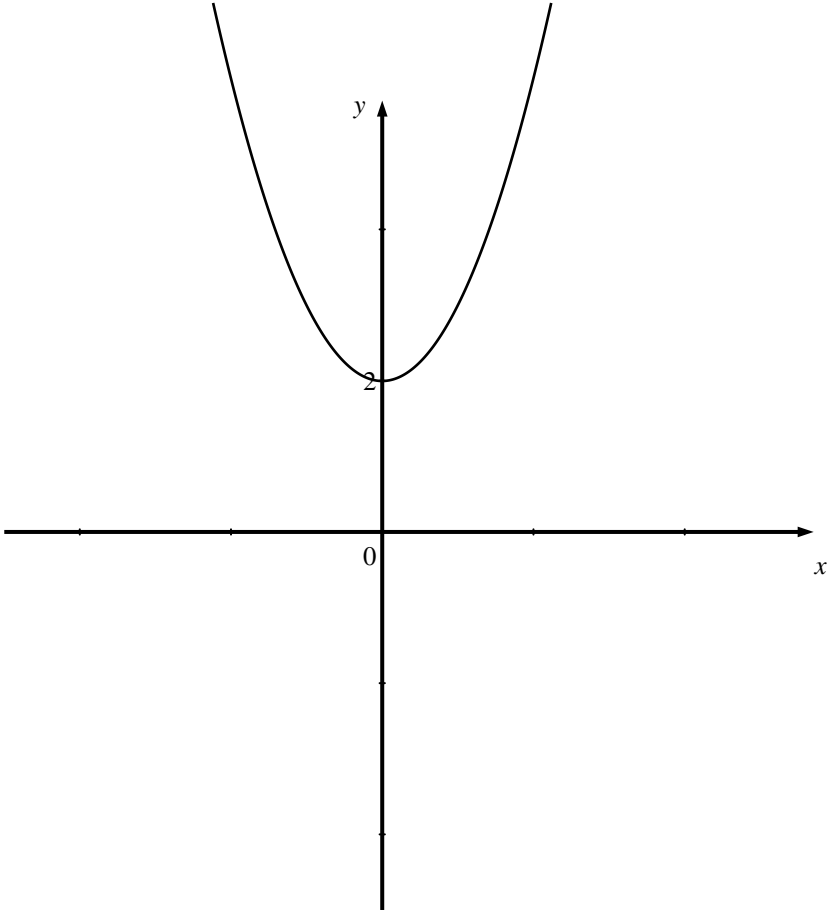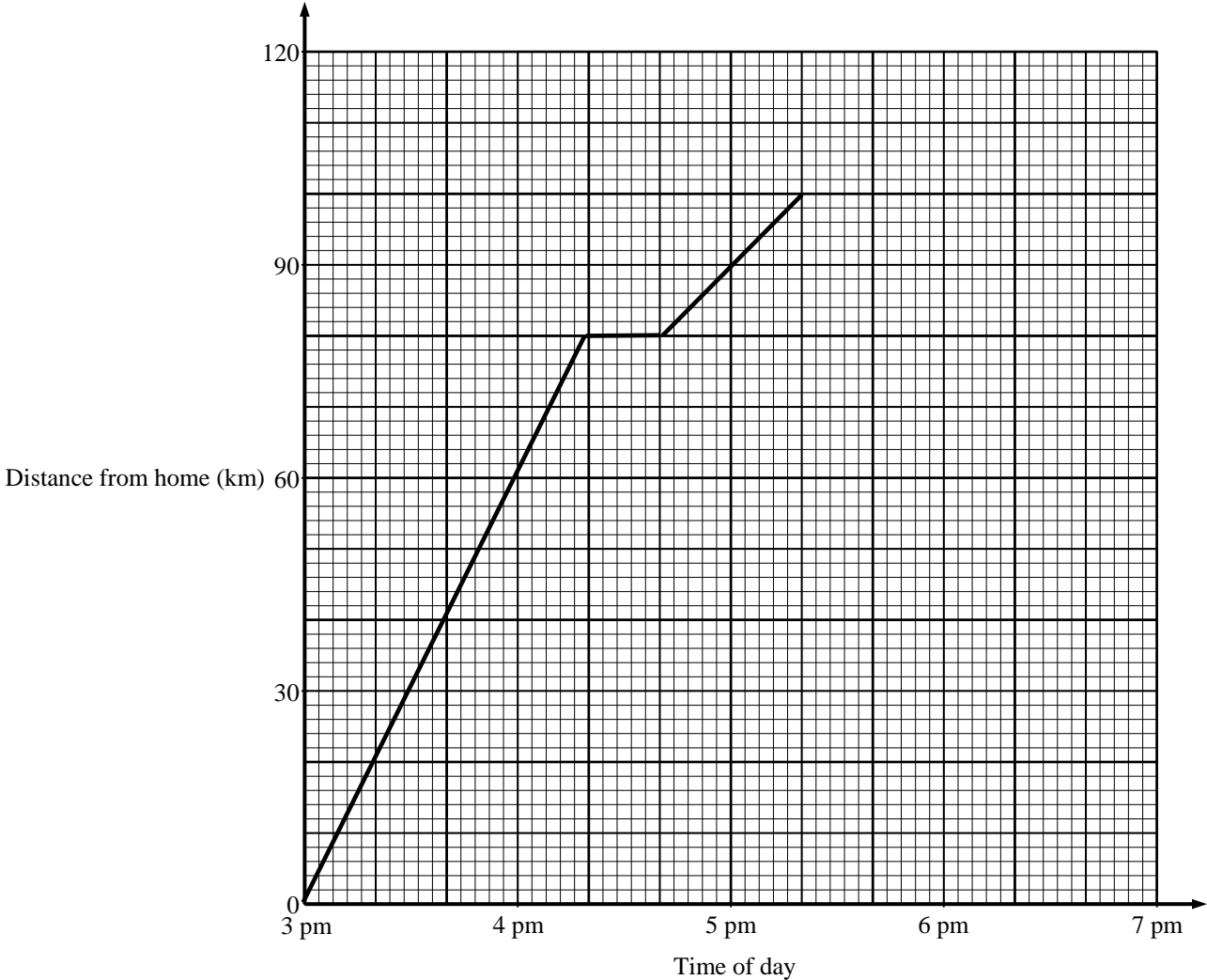| Question	Working	Answer	Mark	Notes
14 (a)	8 (3) (0) −1 (0) 3 (8)	8, −1, 3	2	B2 for all 3 missing values correct (B1 for 1 or 2 missing values correct)
(b)		Correct curve	2	B2 for correct curve (B1 for plotting all their 7 values correctly.)
(c)		−1.4, 3.4	2	M1 for line $y = 5$ drawn to intersect with the curve or for reading at least one value for x when $y = 5$ A1 for −1.4, 3.4 (accept values in the range −1.4 to −1.5 and 3.4 to 3.5) or ft from their parabola

Question 3(b)

Cost (£)

World Cars

UK Cars

Number of days
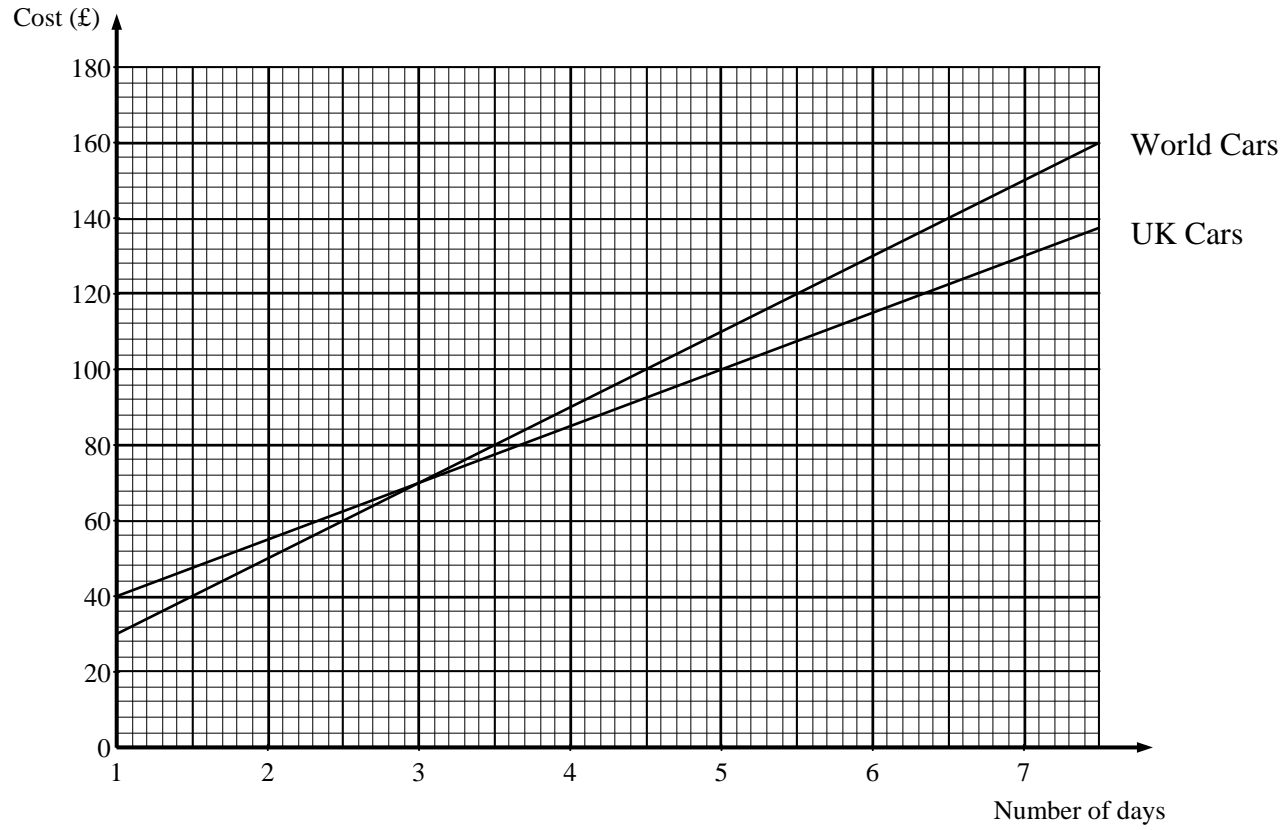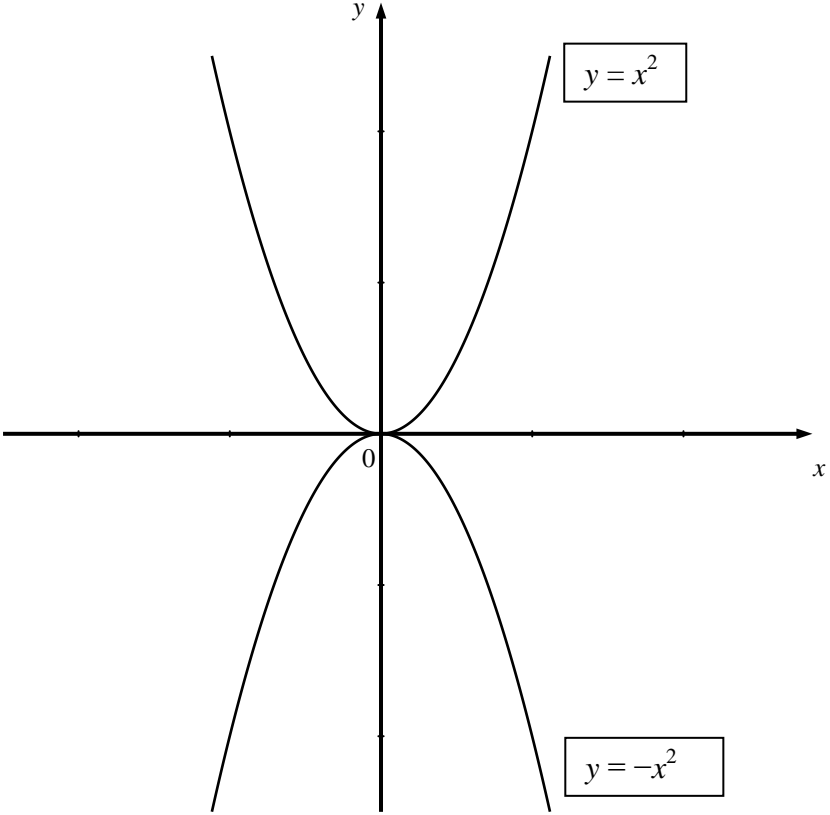
Question 10(a)

(b)

Question 12

Question 14