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Mark Scheme (Results)

Summer 2013

Edexcel Level 2 Award (AAL20)
Algebra

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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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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.
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)		p^7	1	B1 cao
	(b)		q^2	1	B1 cao
	(c)		t^6	1	B1 cao
	(d)		$3a^2b$	2	B2 for $3a^2b^{(1)}$ as one term (B1 for two elements from 3 or a^2 or $b^{(1)}$ in a one term answer)
	(e)	$(-2)^3$	-8	2	M1 for substituting $c = -2$ into the expression ie -2×-2×-2 or $(-2)^3$ A1 cao
2	(a)		4.8	1	B1 cao
	(b)		9.8	1	B1 cao
	(c)		5 and 9	2	M1 for correct use of graph to read off at speed of 9m/s, eg line drawn from 9 across to graph OR one correct answer on answer line A1 for 5 and 9

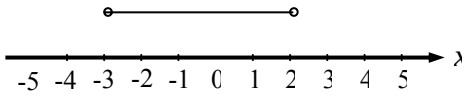
PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
3	(a)		$7x^2 + xy - 4y^2$	2	B2 for $7x^2 + xy - 4y^2$ (B1 for 1 out of 3 terms correct)
	(b)		$6k - 15k^2$	2	M1 for $3k \times 2$ and $3k \times 5k$ A1 for $6k - 15k^2$
	(c)		$w^4 - w^6$	2	M1 for w^4 or w^6 A1 for $w^4 - w^6$
	(d)	$3y - 6 + 10y + 5$	$13y - 1$	2	M1 for $3y - 6$ or $10y + 5$ A1 cao

PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
4		<table><tr><td>x</td><td>–3</td><td>–2</td><td>–1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr><tr><td>y</td><td>–5</td><td>–3</td><td>–1</td><td>1</td><td>3</td><td>5</td><td>7</td></tr></table> OR Using $y = mx + c$ gradient = 2 y intercept = 1	Straight line from (–3 –5) to (3, 7)	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 $x = -3$ and $x = 3$ **(No table of values)** M2 for at least 2 correct points and no incorrect points plotted OR line segment of $y = 2x + 1$ 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 $y = 2x + 1$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 2 OR line drawn with y intercept of 1 and a positive gradient) A1 for correct line between $x = -3$ and $x = 3$

PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
5	(a)	$4p = 20 \times 5$ $p = 100 \div 4$	25	2	M1 for correct method to multiply throughout by 5 or to divide throughout by 4 A1 cao
	(b)	$2t = 3 + 15$ $t = \frac{18}{2}$	9	2	M1 for method to add 15 to each side or to divide each term by 2 A1 cao
	(c)	$5x + 5 = 3x$ $2x = -5$ $x = -\frac{5}{2}$	-2.5	2	M1 for method to multiply out the brackets, eg $5x + 5$ or divide each side by 5, eg $x + 1 = \frac{3x}{5}$ or subtract $3x$ throughout A1 for -2.5 oe
6	(a)		$4(3k + 1)$	2	M1 for $4(3k+a)$ or $4(bk+1)$ or $2(6k+c)$ or $2(dk+2)$ A1 for $4(3k + 1)$
	(b)		$3ad(2d - a)$	2	M1 for partial correct factorisation A1 for $3ad(2d - a)$
7	(a)		Sketch graph	3	B1 for general shape, inverted parabola in all 4 quadrants B1 for symmetry about y axis (must be parabola) B1 for y intercept labelled at (0, 9)
	(b)		Explanation	1	B1 for "the value of y decreases" oe

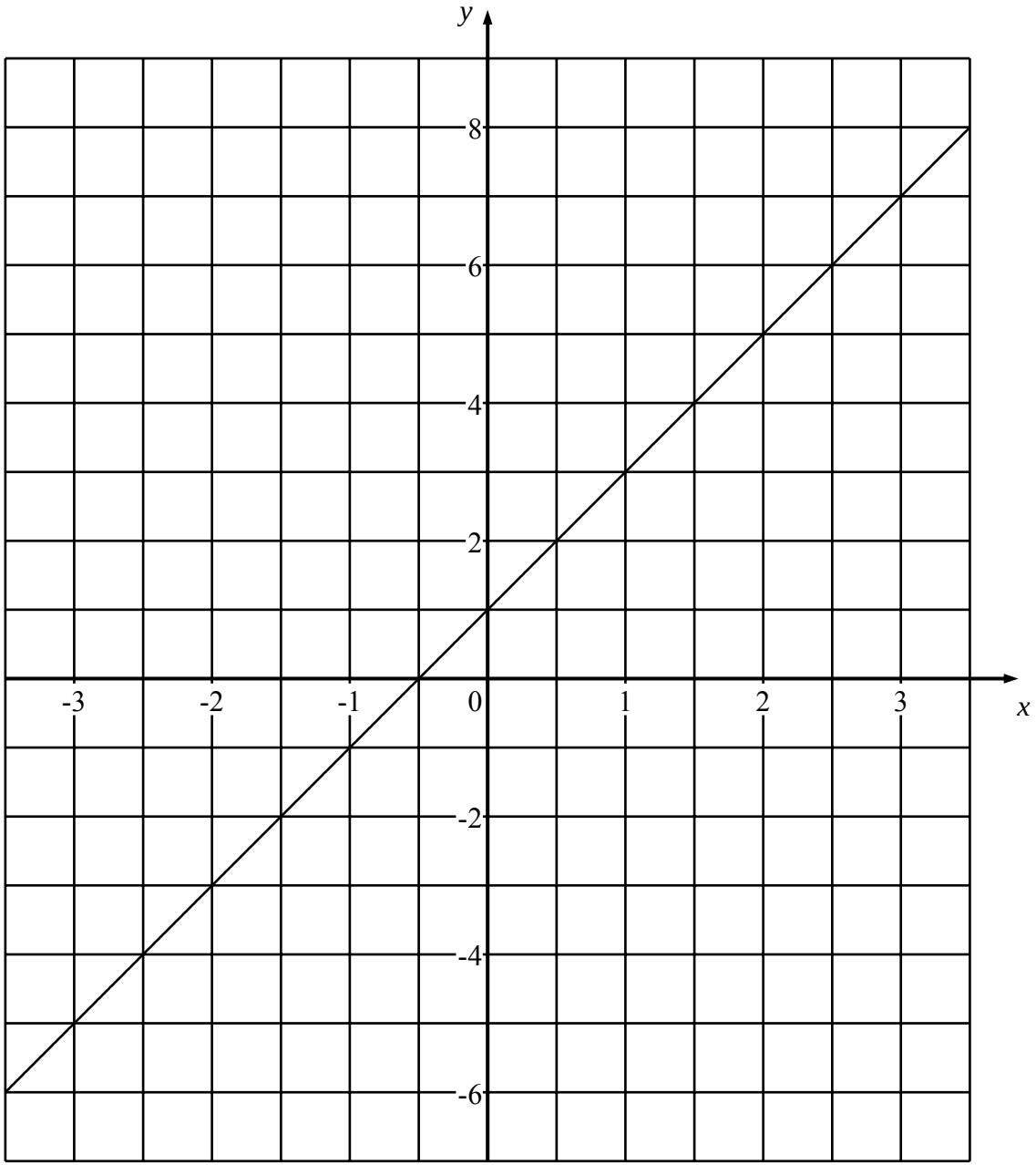
PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
8	(a)	$\frac{3\times11+2}{5}$	7	2	M1 for $\frac{3\times11+2}{5}$ A1 cao
	(b)	$5u = 3t + 2$ $5u - 2 = 3t$	$t = \frac{5u-2}{3}$	3	M1 for attempt to multiply both sides by 5 or sight of $5u = 3t + 2$ or sight of $u = \frac{3t}{5} + \frac{2}{5}$ M1 for isolating term in t on one side A1 for $t = \frac{5u-2}{3}$ oe
	(c)	$7^2 - 4 \times -6 \times 2$	97	2	M1 for correct substitution eg $49 - 4 \times -6 \times 2$ A1 cao
9	(a)		correct graph	2	M1 for graph passing through (0.5, 40) or line with gradient 40 or for at least two points calculated A1 for line through (0.5, 40) and (4, 180)
	(b)		2.25	2	M1 for correct use of graph eg line from 110 across to graph A1 for value in the range 2.2 – 2.3 or ft from their graph provided there is a positive gradient at that point. OR M1 for $(110 - 20) \div 40$ A1 for 2.25 oe

PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
10	(a)	$2 \times 5 - 1$ $2 \times 9 - 1$	9, 17	2	M1 for 2×5 - 1 or 9 A1 cao
	(b)	$3 \times 1 + 4$ $3 \times 2 + 4$	7, 10	2	M1 for substituting n = 1 or n = 2 into the expression 3n + 4 A1 cao
	(c)		$6n - 3$	2	M1 for $6n$ (+ c) A1 for $6n - 3$
11			-1	2	M1 for correct method to find the gradient eg sight of right angled triangle with their height divided by their base A1 cao SC B1 $y = -x + 2$

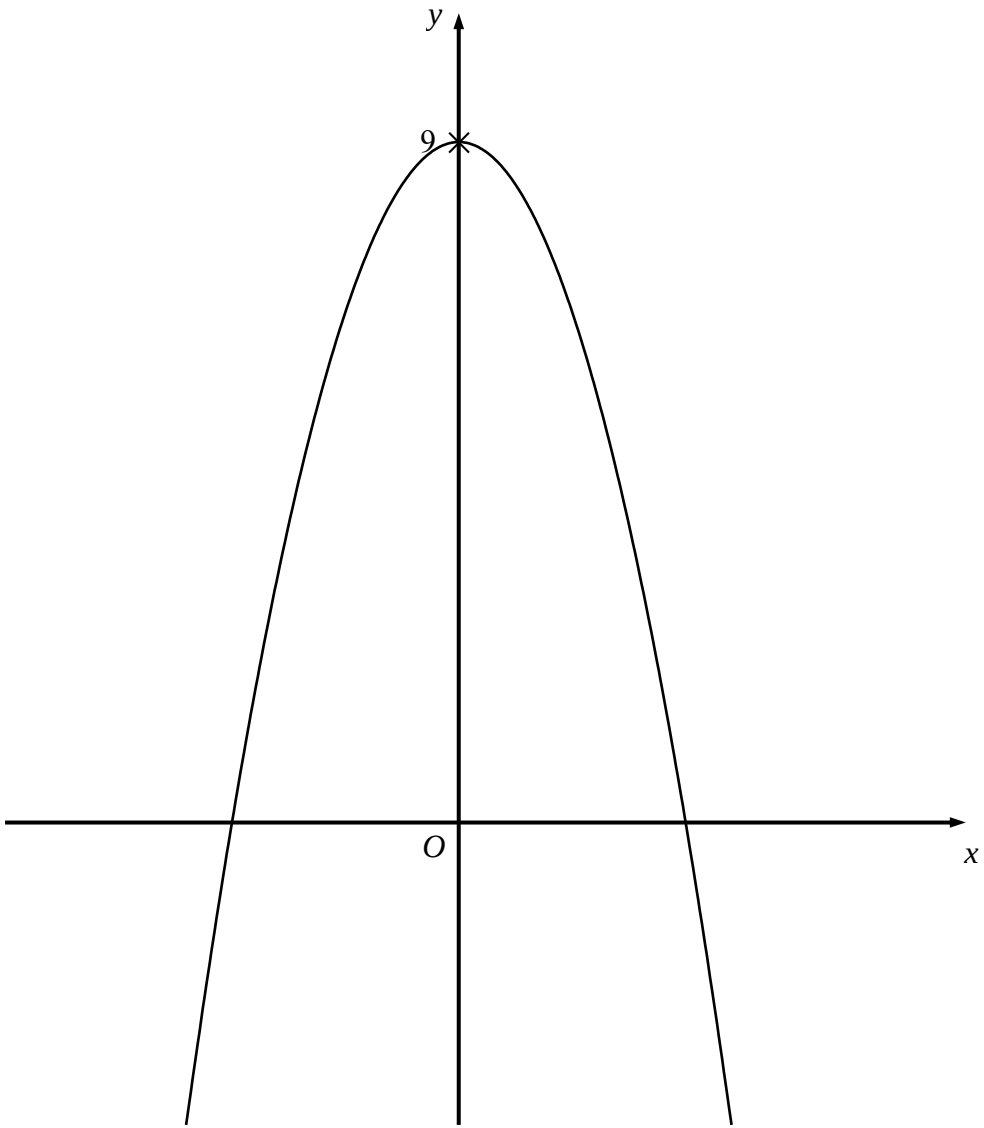
PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
12	(a)		$-2, -1, 0, 1$	2	B2 cao (B1 for at least 3 correct (and no incorrect values), eg $-1, 0, 1$ **or** one additional value, eg $-2, -1, 0, 1, 2$)
	(b)		$y \geq -1$	2	B2 for $y \geq -1$ (B1 for $y > -1$ or ≥ -1) **NB** Accept the use of any letter other than y and ignore attempts to list integer values
	(c)		correct diagram	2	M1 for a line from -3 to 2 A1 for correct diagram with open circles
	(d)	$4x \geq 2x + 6 - 9$ $2x \geq -3$	$x \geq -1.5$	3	M1 for subtracting 6 or 9 from both sides or subtracting $2x$ or $4x$ from both sides M1 for a complete and correct method to isolate x A1 for $x \geq -1.5$ oe SC B2 for -1.5 on the answer line
13			$y = \frac{1}{2}x + 3$	2	M1 for $m = \frac{1}{2}$ oe or $y = \frac{1}{2}x + (c)$ or for $y = mx + 3$ A1 for $y = \frac{1}{2}x + 3$ oe

PAPER: AAL20_01					
Question		**Working**	**Answer**	**Mark**	**Notes**
14	(a)		completed graph	2	B2 fully correct graph (B1 for line from (12, 6) to (12 15, 6) or for a line of constant gradient to 1 pm)
	(b)		10 am and 10 45 am + reason	2	B1 for 10 (am) to 10 45 (am) B1 for explanation, eg because the gradient of the graph is greatest oe
15	(a)		$p(m + t)$	2	B2 for $p(m + t)$ oe (B1 for pm or pt or $m + t$ oe used)
	(b)		$60 - 8n$	2	B2 for $60 - 8n$ oe (B1 for $8n$ oe used)
16	(a)		1, −1, −0.5, 1	2	B2 for all 4 missing values correct (B1 for 2 or 3 missing values correct)
	(b)		Correct curve	2	B2 for correct curve (B1 for plotting all their values correctly)
	(c)		−0.7, 0.7	2	M1 for both intersects with x axis indicated or for reading at least one value for x when $y = 0$ A1 ft for ±0.7 (accept 0.65 – 0.75) or value from their parabola

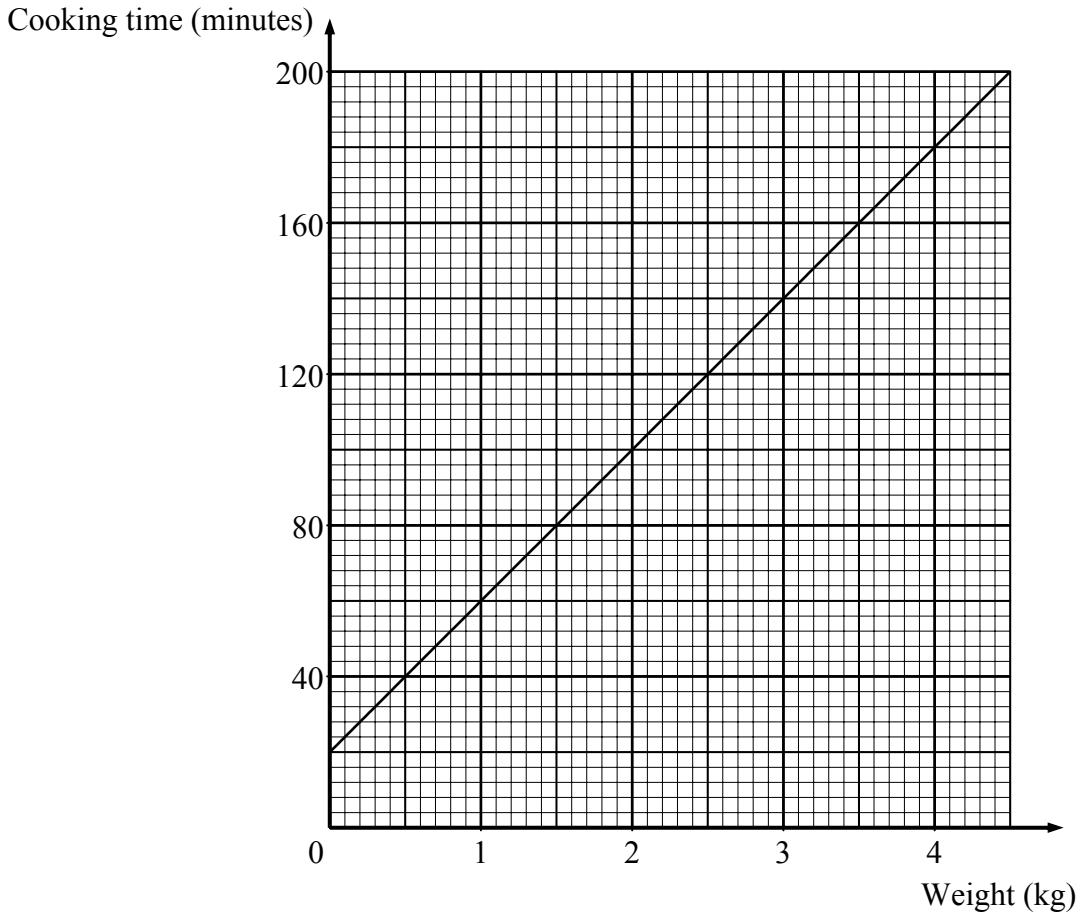
Q4



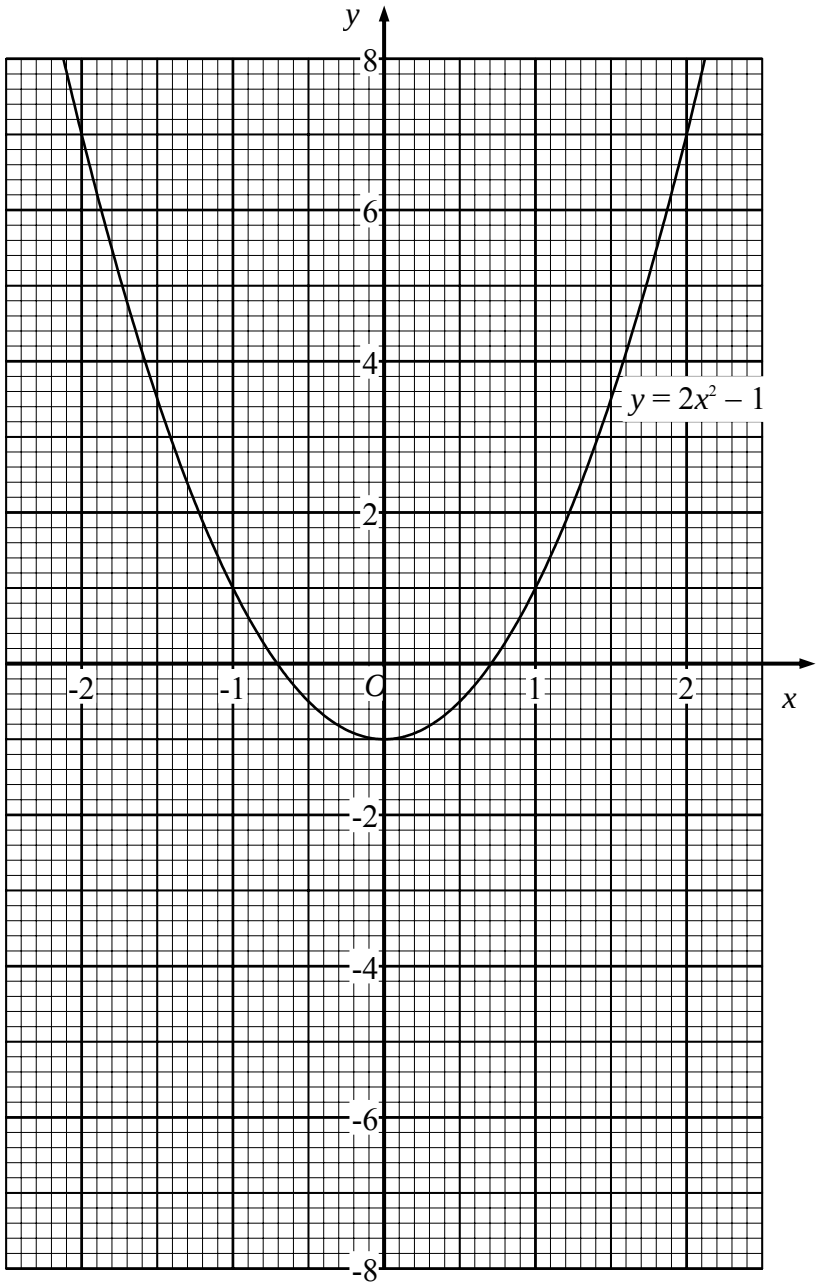
7(a)



Q9



Q16(b)



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