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Edexcel GCSE

Mathematics A 1387

Paper 5525/05

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Mark Scheme (Results)

Edexcel GCSE

Mathematics A 1387

NA

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

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: 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.

7 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 then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 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.

9 Parts of questions

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

Paper 5525/05					
No		Working	Answer	Mark	Notes
1	(a)	$75 \div (3+1+1) = 15$ $15 \times 3 = 45$	45	3	M1 for $75 \div (3+1+1)$ M1(dep) for "15" $\times 3$ A1 cao
	(b)	0.8×200	160	2	M1 for 0.8×200 A1 for 160, accept 160 out of 200 SC: B1 for $\frac{160}{200}$ or 160 in 200
2	(a)		$4n - 1$	2	B2 for $4n - 1$ (B1 for $4n + k$ *or* kn -1 , k any integer)
	(b)		Yes	2	M1 for "$4n - 1$" = 319 A1 for $n = 80$ accept: 4(80) – 1= 319; 320 is a multiple of 4, subtract 1 gives 319; if you add 1 and divide by 4 you get a whole number; yes it's the 80th term .
3	(a)	2.3×20	46	2	M1 for 2.3×20 A1 cao
	(b)	$480 \div 400$	1.2	2	M1 for $480 \div 400$ A1 for 1.2 or equivalent reduced fraction
4			386 – 420	3	M1 for 2 of 20, 4, 0.2 A1 for $\frac{80}{0.2}$ or $\frac{84}{0.2}$ or 100×4 or 105×4 or 20×20 or 21×20 A1 for answer in range 386 – 420

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No		Working	Answer	Mark	Notes
5	(a)	$3x - 12 = x + 24$ $2x = 36$	18	3	M1 for $3 \times (x-4) = x + 24$ or $\frac{3(x-4)}{3} = \frac{x+24}{3}$ M1 for $3x - x = 24 + 12$ or $x - \frac{x}{3} = \frac{24}{3} + 4$ oe A1 cao
	(b)		$16x^{12}y^4$	2	B2 cao (B1 for $2^4 x^{3\times4} y^4$, with one error allowed in powers)
6	(a)		reflection line $y = x$	2	B1 for reflection B1 for line $y = x$ (if B0 then B1 for line $y=x$ drawn on diagram)
	(b)	Triangle with vertices at (–1, 3), (–3, 3) and (–3,4)		2	M1 for correct orientation or for a rotation of 90° clockwise about (-1,1) A1 cao
7	(a)		–3,–2,–1,0,1		B2 cao (-1 each error or omission)
	(b)	$3x < -6$	$x < -2$		M1 for subtracting $2x$ from both sides, condone sign error in 6 and use of =, >, ≤, ≥ A1 for $x < -2$, accept $x < -\frac{6}{3}$

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No	Working	Answer	Mark	Notes
8	$\frac{17}{5}-\frac{7}{4}$ or $3-1$ and $\frac{2}{5}-\frac{3}{4}$ oe $\frac{68}{20}-\frac{35}{20}$ or $\frac{8}{20}-\frac{15}{20}$ or $2\frac{29}{20}-\frac{15}{20}$	$1\frac{13}{20}$	3	M1 for correctly decomposing into non mixed numbers M1 for correct method to write all fractions to a common denominator A1 for $\frac{33}{20}$ oe single fraction or mixed number ALT: B1 for 3.4 and 1.75 M1 for attempt to subtract 2 decimal (condone one error) A1 for 1.65 cao
9		Area Length None of these	3	B1 for Area only B1 for Length only B1 for None of these only
10 (a)		0.00057	1	B1cao
(b)		2.1×10^{10}	2	M1 for $(7\times3)\times10^{4+5}$ or better, eg 21×10^{9}, 21 000 000 000 A1 cao
11	Eg eqn(1) × 3 and eqn(2) × 4 then add leads to $17x=51$ Eqn (1) × 2 and eqn(2) × 3 then subtract leads to $-17y=17$	$x=3, y=-1$	4	M1 for coefficients of x or y the same followed by correct operation, condone one arithmetical error A1 cao for non-eliminated variable M1 (dep on previous M mark) for correctly substituting their found value A1 cao (need both answers) SC: B1 for one correct answer only if Ms not awarded

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No		Working	Answer	Mark	Notes
12	(a)		14	1	B1 cao
	(b)		8	1	B1 cao
	(c)	$25/100 \times 300$	75	2	M1 for 25% of 300 or $300 \div 4$ or $\frac{1}{4} \times 300$ oe A1 cao
13	(a)		70	2	M1 for $180 - (20+90)$ or angle CDA = 90° seen A1 cao
	(b)		20	2	B1 cao B1 for angles in the same segment (are equal) or angles subtended by same arc at circumference
14	(a)		0.6 0.6, 0.4, 0.6	2	B1 for LHS: (0.4), 0.6 B1 for RHS: (0.4), 0.6, 0.4, 0.6
	(b)	$0.4 \times 0.4 = 0.16$	0.16	2	M1 for 0.4×0.4 or $\frac{4}{10} \times \frac{4}{10}$ oe A1 for 0.16 or $\frac{4}{25}$ or $\frac{16}{100}$ oe
15	(a)	nth row $= n^2 - (n-1)(n+1)$	$n^2 - (n+1)(n-1)$	1	B1 for $n^2 - (n-1)(n+1)$ oe (condone $n^2 \quad (n+1)(n-1)$)
	(b)	$n^2 - (n-1)(n+1) = n^2 - (n^2 - 1) = 1$	1	2	M1 for $(n-1)(n+1) = n^2 - 1$ A1 cao (SC: B1 for 1 on answer line without working)

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No		Working	Answer	Mark	Notes
16	(a)		$y=\frac{1}{2}x+k$	1	B1 for $y = ½x + k$, $k \neq 1$
	(b)		$y = mx + 1$	1	B1 for $y = mx + 1$, $m \neq ½$, or $x = 0$
	(c)		$y = -2x + 26$	3	M1 for $m = -\frac{1}{(\frac{1}{2})}$ or $\frac{1}{2}m = -1$ M1 for substituting (10,6) into $y=mx+c$ oe A1 for $y = -2x + 26$ oe
17	(a)		390	2	B1cao
			400		B1 cao
	(b)		Correct bar	1	B1 for correct bar
18		$\frac{60}{360}\times 2\times\pi\times 12$	4π	3	M2 for $\frac{60}{360}\times 2\times\pi\times 12$, accept numerical π (M1 for $\frac{60}{360}\times k$, where k in terms of π, or $n\times 2\times\pi\times 12$, n < 1) A1 for 4π or $\frac{a\pi}{b}$ cao, where a and b are correct integers
19	(a)(i)		1/2	2	B1cao oe
	(ii)		–1/2		B1 cao oe
	(b)(i)	Draws horizontal line $y = -0.4$	114 and 246	4	M1 for use of $y = -0.4$ (may be implied by one correct solution) A1 for both 114 ± 6 and 246 ± 6
	(ii)	Draws horizontal line $y = 0.75$	36 and 324		M1 for use of $y = 0.75$ (may be implied by one correct solution) A1 for both 36 ± 6 and 324 ± 6

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No		Working	Answer	Mark	Notes
20	(a)	$6x^2 - 4x + 15x - 10$	$6x^2 + 11x - 10$	3	M2 for 3 of 4 terms $6x^2 - 4x + 15x - 10$ correct (M1 for 2 terms correct) A1 for $6x^2 + 11x - 10$
	(b)(i)	$(x+3)^2 - 3^2 - 5$	$p = 3$	3	B1 for $p = 3$
	(ii)	$(x+3)^2 - 14$	$q = -14$		M1 for an attempt to factorise, eg $(x \pm 3)^2 \pm 3^3$ A1 for $q = -14$
21	(a)		8	1	B1 cao
	(b)	$\sqrt{8} = \sqrt{4x2} = 2\sqrt{2}$	$2\sqrt{2}$	2	B2 cao (B1 for $\sqrt{4x2}$ or $\sqrt{4}\ \sqrt{2}$ or $\sqrt{2}\ \sqrt{2}\ \sqrt{2}$ or $\sqrt{2^3}$) (Accept 2 on answer line if $2\sqrt{2}$ seen)
	(c)	$\sqrt{25\times 2} = \sqrt{25}\sqrt{2} = 5\sqrt{2}$	$5\sqrt{2}$	2	B2 cao (B1 for $\sqrt{25\times 2}$ or $\sqrt{25}\sqrt{2}$ or $\sqrt{5}\ \sqrt{5}\ \sqrt{2}$) (Accept 5 on answer line if $5\sqrt{2}$ seen)
	(d)	$\frac{1+\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}(1+\sqrt{2})}{\sqrt{2}\times\sqrt{2}} = \frac{\sqrt{2}+\sqrt{2}\sqrt{2}}{2} =$ $\frac{\sqrt{2}+2}{2}$	$\frac{\sqrt{2}+2}{2}$	2	M1 for $\times\sqrt{2}$ top and bottom A1 cao oe

Paper 5525/05				
No	Working	Answer	Mark	Notes
22 (a)(i)		$-3\boldsymbol{a}+\boldsymbol{b}$	4	B1 for $-3\mathbf{a}+\mathbf{b}$ accept $-2\mathbf{a}-\mathbf{a}+\mathbf{b}$ oe B1 for $-2\mathbf{a}+2\mathbf{b}$ accept $-2\mathbf{a}+\mathbf{b}+\mathbf{b}$ oe
(ii)		$-2\boldsymbol{a}+2\boldsymbol{b}$		
(iii)	$\vec{PQ}=\vec{PA}+½\vec{AB}$ or $\vec{PQ}=\vec{PO}+\vec{OB}+½\vec{BA}$ $=\boldsymbol{a}+½(-3\boldsymbol{a}+\boldsymbol{b})$ $=-2\boldsymbol{a}+\boldsymbol{b}+½(3\boldsymbol{a}-\boldsymbol{b})$	$-\frac{1}{2}\boldsymbol{a}+\frac{1}{2}\boldsymbol{b}$		M1 for $(\vec{PQ}=)\vec{PA}+½"\vec{AB}"$ or $(\vec{PQ}=)\vec{PO}+\vec{OB}\pm½"AB"$ A1 for $-\frac{1}{2}\boldsymbol{a}+\frac{1}{2}\boldsymbol{b}$, accept $\boldsymbol{a}+\frac{b-3a}{2}$ oe
(b)	$\vec{PR}=4\vec{PQ}$ so PR is 'parallel' to PQ so PQR is a straight line	$\vec{PR}=4\vec{PQ}$	2	M1 for $PR=4PQ$ oe or comparing $2(-\boldsymbol{a}+\boldsymbol{b})$ with $½(-\boldsymbol{a}+\boldsymbol{b})$ A1 for a fully correct proof
(c)		12	1	B1 cao
23	$y^2=(x-7)^2$ $x^2+x^2-14x+49=25$ $2x^2-14x+49=25$ $2x^2-14x+24=0$ $2(x^2-7x+12)=0$ $2(x-4)(x-3)=0$	$x=3$ $y=-4$ $x=4$ $y=-3$	6	M1 $y^2=(x-7)^2$ seen or implied M1 for x^2+x^2 +/ - $14x+49=25$ (oe expanded form) M1 for correct attempt to solve 3 term quadratic A1 for $x=3$, $x=4$ cao M1 (dep. on previous Ms) for sub. one value of x into either equation A1 for $x=3$, $y=-4$ and $x=4$, $y=-3$ SC : B2 for $(4,-3)$ and $(3,-4)$ if M's not awarded B1 for $(4,-3)$ or for $(3,-4)$ if M's not awarded