GCSE

Edexcel GCSE

Mathematics A 1387

Summer 2006

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

No		Working	Answer	Mark	Notes
1		P marked at top left and bottom		2	B2 for both correct (B1 for one correct) (–B1 for each error if more than 2Ps)
2		$36 \div 9$ 1 part = 4 8 : 12 : 16	A 8 B 12 C 16	3	M1 for $36 \div (2+3+4)$ M1 (dep) $2\times$ '4' or $3\times$'4' or $4\times$'4' A1 cao
3	(a)		Overlay (a)	2	B2 for correct triangle with arcs (B1 for correct triangle , no arcs)
	(b)		Overlay(b)	2	M1 for 2 pairs of correct intersecting arcs A1 for correct perpendicular bisector SC If no marks B1 for line within guidelines
4		No because when $n = 6$ $6n - 1$ (= 35) is not prime		2	B2 correctly showing when $n = 6$, 35 is obtained and identified oe or for correctly evaluating $6n - 1$ when n is 0 or negative. (B1 for correctly evaluating $6n - 1$ for at least 3 different whole number values of n or 35 oe with no working)
5		$3\% = 0.72$ $1\% = 0.24$ $100\% = 24$ $103\% = 24.72$	24.72	3	M1 for $3\% = 0.72$ or $0.03x = 0.72$ M1 for $1\% = 0.24$ oe or 24 or 0.72×33.3 or $\dfrac{0.72}{3}\times103$ A1 for 24.72 SC B2 for 24 seen
6	(a)(i)		x^9	1	B1 cao
	(ii)		p^5	1	B1 cao
	(iii)		$12\, s^6\, t^5$	2	B2 cao (B1 for two of 12, s^6, t^5 in a product)
	(iv)		q^{12}	1	B1 cao
	(b)		$6g - 3$	1	B1 cao
	(c)		$2d^2 + 6d$	2	B2 cao (B1 for $2d^2$ or $6d$)
	(d)	$x^2 + 3x + 2x + 6$	$x^2 + 5x + 6$	2	B2 for $x^2 + 5x + 6$ (B1 for 3 out of 4 parts correct in working)

No	Working	Answer	Mark	Notes
7	$4^2 + 6^2$ $16 + 36 = 52$ $\sqrt{52}$	7.21	3	M1 for $4^2 + 6^2$ or $16 + 36$ or 52 M1 for $\sqrt{16+36}$ or $\sqrt{52}$ A1 for 7.21- 7.212
8 (a)		$35 \leq t < 40$	1	B1 for correct interval
(b)	8×22.5 3×27.5 7×32.5 7×37.5 15×42.5 $1390 \div 40$	34.75	4	M1 for fx consistently within interval including ends (allow 1 error) M1 (dep) consistently using midpoints . M1 (dep on 1st M) for $\sum fx \div \sum f$ A1 for 34.75 or 34.7 or 34.8
9 (a)	$\dfrac{\sqrt{6.06}}{1.985}$	1.24015	2	B2 for 1.24015 ……… (B1 for sight of 2.46(….) or 1.985 or 1.24(….))
(b)		1.24	1	B1 ft any answer to (a) correctly rounded to 2, 3 or 4 significant figures
10		Rotation 180º centre (0,0)	3	B1 for rotation B1 for 180º or $\dfrac{1}{2}$ turn B1 for (0,0) Or B2 enlargement SF – 1 B1 centre (0,0) If no marks awarded SC B1 for correct reflections
11		$a = 3$ $b = -2$	3	M1 for a complete method which leads to a single equation in a or b only (allow 1 error) M1 (dep) substitute found value of a or b into one equation A1 cao SC B1 for one correct answer only if Ms not awarded, $a = 3$ or $b = -2$

No	Working	Answer	Mark	Notes
12 (a)	$\tan a = \dfrac{5}{6}$ Angle $a = 39.8°$	39.8		M1 for $\tan(a=)\dfrac{5}{6}$ M1 for $a = \tan^{-1}(\dfrac{5}{6})$ or $\tan^{-1}(0.83)$ to $\tan^{-1}(0.834)$ (Allow $\tan^{-1} 5 \div 6$) A1 for 39.8- 39.81 SC 0.692 – 0.695 or 44.2 – 44.24 seen gets M1M1 A0
(b)	$\sin 40° = \dfrac{x}{10}$ $x = 10 \times \sin 40°$	6.43		M1 for $\sin 40 = \dfrac{x}{10}$ M1 for $10 \times \sin 40$ A1 for 6.427 – 6.43 (SC 7.45… or 5.87… seen gets M1M1 A0)
13 (a)(i)		**p + q**	2	B1 cao **p + q**
(ii)		**q – p**		B1 **q – p** oe
(b)		$\dfrac{1}{2}$**(p + q)**	1	B1 $\dfrac{1}{2}$**(p + q)** oe
14	8×50^2	20 000cm²	2	M1 for 50^2 seen A1 for 20 000cm² or 2 m²
15 (a)		−2, −1, 0, 1, 2	2	B2 for all correct (B1 for −1,0,1 if seen in list , B1 for −2 , −1, 1, 2)
(b)	$4p + p < 8 + 7$ $p < 3$	$p < 3$	2	M1 for $4p + p < 8 + 7$ A1 cao
16		P and C Q and D R and B S and A	2	B2 for all correct (B1 for exactly 2 or exactly 3 correct)

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No	**Working**	**Answer**	**Mark**	**Notes**
17	$m = \dfrac{-4}{4} = -1$ $c = 3$	$y = -x + 3$	4	M1 for clear attempt to find gradient of AB A1 for $m = -1$ B1 for $c = 3$ in $y = mx + c$ m does not have to be numerical A1 for $y = -x + 3$ oe SC B2 for $y = x + 3$ seen B3 for $-x + 3$ on its own B1 for $x + 3$ on its own
18 (a)		$\dfrac{1}{4}$ $\dfrac{2}{3} \quad \dfrac{1}{3} \quad \dfrac{2}{3}$	2	B1 for $\dfrac{1}{4}$ correct on tennis B1 for $\dfrac{2}{3}, \dfrac{1}{3}, \dfrac{2}{3}$ correct on snooker
(b)	$\dfrac{3}{4} \times \dfrac{1}{3}$	$\dfrac{1}{4}$	2	M1 for $\dfrac{3}{4} \times \dfrac{1}{3}$ A1 for $\dfrac{1}{4}$ oe
(c)	$\dfrac{3}{4} \times \dfrac{2}{3} + \dfrac{1}{4} \times \dfrac{1}{3}$ $\dfrac{1}{2} + \dfrac{1}{12}$	$\dfrac{7}{12}$	3	M1 for $\dfrac{3}{4} \times "\left(\dfrac{2}{3}\right)'" \textbf{ or } "\left(\dfrac{1}{4}\right)" \times "\left(\dfrac{1}{3}\right)"$ M1 $\dfrac{3}{4} \times "\left(\dfrac{2}{3}\right)'" + "\left(\dfrac{1}{4}\right)" \times "\left(\dfrac{1}{3}\right)"$ A1 for $\dfrac{7}{12}$ oe (0.58…) Or M2 for $1 - \left(\dfrac{3}{4} \times \dfrac{1}{3} + \dfrac{1}{4} \times \dfrac{2}{3}\right)$ A1 for $\dfrac{7}{12}$ oe (0.58…)

No		Working	Answer	Mark	Notes
19	(a)(i)		6.75	1	B1 cao
	(ii)		6.65	1	B1 cao
	(b)(i)	$26.95 \div 6.65$	4.05263	3	M1 for "26.95" ÷ "6.65" where 26.9 < "26.95" ≤ 26.95 and 6.65 ≤ "6.65" < 6.7
					A1 for 4.05263 (….)
	(ii)	$26.85 \div 6.75$	3.97778		If M1 not earned in (i), then M1 for '26.85'÷'6.75' where 26.85 ≤ '26.85' < 26.9 and 6.7 < '6.75' ≤ 6.75
					A1 for 3.9777 (…..)
	(c)(i)		4	2	B1 cao
	(ii)		bounds agree to 1sf		B1 for appropriate reason for 4
20	(a)	$27x^6 y^{12}$	$27x^6 y^{12}$	2	B2 for fully correct
					B1 for 2 of 27, x^6, y^{12} correct in a 3 term product
	(b)	$6x^2 + 15x - 4x - 10$	$6x^2 + 11x - 10$	2	B2 for fully correct
					(B1 for 3 out of 4 terms correct in working including signs or 4 terms correct, incorrect signs)
	(c)	$\dfrac{(x+2)(x+3)}{x(x+2)}$	$\dfrac{x+3}{x}$	2	B2 for $\dfrac{x+3}{x}$
					(B1 for $x(x + 2)$ or $(x + 2)(x + 3)$ seen)
21		$x = \dfrac{5 \pm \sqrt{25 - 4 \times 1 \times -8}}{2}$	6.27 or −1.27	3	M1 for correct substitution into formula up to signs on b and c
		$\dfrac{5 \pm \sqrt{57}}{2} = \dfrac{5 \pm 7.54983}{2}$			M1 for $\dfrac{5 \pm \sqrt{57}}{2}$
		$x = 6.2749$ or $x = -1.2749$			A1 6.27 to 6.275 and −1.27 to −1.275

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No	**Working**		**Answer**	**Mark**	**Notes**
22 (a)	$\dfrac{120}{360}$ or $\dfrac{1}{3}$ $\dfrac{120}{360} \times 2\pi \times 10.4$		21.7 – 21.8	3	B1 for $\dfrac{120}{360}$ or $\dfrac{1}{3}$ seen M1 for $\dfrac{120}{360} \times 2\pi \times 10.4$ A1 for 21.7 - 21.8
(b)	Area Sector $= \pi(10.4)^2 \div 3 = 113.26488$ Area Triangle $= \dfrac{1}{2}(10.4)(10.4)\sin 120°$ $= 46.8346$ Area segment $= 66.43 \ldots$		66.4	4	M1 for $\pi(10.4)^2 \div 3$ or $\pi(10.4)^2 \times \dfrac{120}{360}$ oe M1 for $\dfrac{1}{2}(10.4)(10.4)\sin 120°$ or any other valid method for area triangle *OAC* M1 (dep on at least 1 of the previous Ms) for area of sector – area of triangle *OAC*, providing the answer is positive. A1 66.35 – 66.5
23	$\dfrac{\sin ADB}{25} = \dfrac{\sin 28}{DB}$ $DB = \dfrac{25 \times \sin 28}{\sin 26}$ $DB = 26.77$ $DC = 26.77 \times \sin 54$		21.7	5	M1 for $\dfrac{\sin"26"}{25} = \dfrac{\sin 28}{DB}$ M1 for $DB = \dfrac{25 \times \sin 28}{\sin"26"}$ A1 for 26.7 – 26.8 M1 for $DC = "26.7" \times \sin 54$ A1 for 21.65 – 21.7 Or M1 for $\dfrac{\sin"26"}{25} = \dfrac{\sin"126°"}{AD}$ oe M1 for $AD = \dfrac{25 \times \sin"126°"}{\sin 26°}$ A1 for 46.1 – 46.2 M1 for "46.1" $\times \sin 28°$ A1 for 21.65 – 21.7

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No	**Working**	**Answer**	**Mark**	**Notes**
24	Draw circle centre (0,0) radius 4 Draw a line through (1,2) Show two intersections	Fully correct explanation	3	M1 circle or semi-circle centre (0, 0) drawn or plotted with at least 8 points or stated A1 correct circle drawn or stated A1 straight line drawn through (1, 2) and cutting the (possibly freehand) circle at 2 distinct points or for stating that any straight line through (1,2) will cut the circle in 2 places as (1,2) is inside the circle