edexcel

GCSE

Edexcel GCSE

Mathematics B 1388

Paper 5536/18

Summer 2005

advancing learning, changing lives

Mark Scheme (Results)

Edexcel GCSE
Mathematics A 1388
Paper 5536/17

accac QCA

cea Rewarding Learning

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If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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

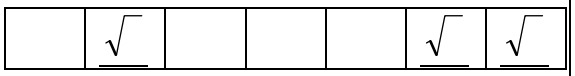
Probability answers must be given a fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability 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 a

Paper 5538/18				
No	**Working**	**Answer**	**Mark**	**Notes**
1		$p(p+6)$	2	B2 for $p(p+6)$ or $p\times(p+6)$ (B1 for $p(ap+b)$ where a,b are numbers or $p+6$ seen on it's own, or part of an expression)
2		question + response boxes oe	2	1st aspect: One question with time period (eg each night); ignore other questions. 2nd aspect: Response list (at least two), not overlapping.* 3rd aspect: Some mention of units (eg hours) in either question or responses Award B2 for all three aspects, or B1 for just two aspects. * 0-1, 2-3, 4-5 is OK, but 0-1, 1-2, 2-3 is not OK.
3	$1+2+\frac{8}{12}+\frac{9}{12}$	$4\frac{5}{12}$	3	M1 for attempt to convert to fractions with common denominator e.g two fractions, denominator of 12 A1 correct conversion : $\frac{8}{12}$ and $\frac{9}{12}$, or $\frac{20}{12}$ and $\frac{33}{12}$ seen (oe) A1 cao for $4\frac{5}{12}$ OR attempts to convert to decimals: must use at least 2dp M1 0.66+0.75 (or 1.66+2.75) A1 4.41, 4.417, 4.416 A1 $4.41\dot{6}$
4		$\frac{\pi ab^3}{3d}$ $3(c+d)^3$ $3\pi bc^2$	3	B3 (B1 for each one correct) NB –B1 for each of the 4th,5th,6th tick

Paper 5538/18					
No		**Working**	**Answer**	**Mark**	**Notes**
5	(a)	$x + 0.3 + 0.2 + x = 1$	0.25	2	M1 for $x + 0.3 + 0.2 + x = 1$ oe, or $0.5 \div 2$ A1 oe
	(b)	0.3×200	60	2	M1 0.3×200 A1 cao SC B1 for $\frac{60}{200}$
6	(a)	$\frac{5 - -1}{-1 - 2} = -2$	$y = -2x + 5$	4	M1 for clear attempt to find gradient eg fraction with -1,5 in numerator, 2,-1 in denominator A1 for -2 B2 ft for $y = "-2"x + 5$ oe (eg $y = \frac{-6}{3}x + 5$) (B1 for $y = mx + 5$ or , -2x+5 or $y = "-2"x + c$)
	(b)	gradient $= \frac{1}{2}$	$y = \frac{1}{2}x$	2	M1 for $"-2" \times$ gradient $= -1$ A1 ft for $y = \frac{-1}{"-2"}x$

Paper 5538/18					
No		Working	Answer	Mark	Notes
7	(a)(i)		150	2	B1 accept 150 or 210
	(ii)				B1 for angle at the centre is twice the angle at the circumference
	(b)		30	3	B1 identifies angle between radius and tangent as $90°$ (may be in working or on diagram)
		$360-90-90-"150"$			M1 $360^\circ-90-90-"150"$ A1 ft from (a)(i) excluding a negative answer OR B1 for 90 M1 for $2\times(180-90-"\frac{150}{2}")$ A1 ft from (a)(i) excluding a negative answer OR B3 for $180-$(a)

Paper 5538/18					
No		**Working**	**Answer**	**Mark**	**Notes**
8	(a)		0.2727…	1	B1 for 0.2727…. oe or 0.273
	(b)	eg $x = 0.3939\ldots$ so $100x = 39.3939\ldots$ $99x = 39$ so $x = \frac{39}{99} = \frac{13}{33}$		3	M1 for $100x = 39.39\ \ldots$ M1 dep for subtraction of both sides A1 for $\frac{13}{33}$ from correct proof **Alternative method** M1 for $13.000 \div 33$ M1 for remainders 31 and 13 A1 for $0.\dot{3}\dot{9}$ [SC:B1 for $\frac{39}{99}$]
9	(a)	$d = kt^2$ $80 = k \times 4^2$	$d = 5t^2$	3	M1 for $d = kt^2$ or $d \propto t^2$ M1 sub d=80 and t=4 into their equation A1 for $d = 5t^2$ oe
	(b)		245	1	B1 ft from (a) using "k"
	(c)	$45 = 5t^2$	3	2	M1 ft from (a) for substituting d=45 into their equation A1 for 3 cao (condone inclusion of -3)

Paper 5538/18					
No		**Working**	**Answer**	**Mark**	**Notes**
10	(a)(i)		(0, 9)	3	B1 cao
	(ii)		(8, 25)		B1 for $x = 8$ cao B1 for $y = 25$ cao SC: B1 for (25, 8)
	(b)	LHS $= \left(\dfrac{100-(x^2-16x+64)}{4}\right)$ $= \left(\dfrac{36+16x-x^2}{4}\right)$ RHS $= \left(\dfrac{36-2x+18x-x^2}{4}\right) =$ LHS		3	M1 for expansion of either set of brackets with at least 3 of 4 terms correct M1 for common denominator of 4 or multiplying through by 4 or reducing each numerator to a single term A1 for fully correct solution **Alternative method** M1 for $(5-\frac{(x-8)}{2})(5+\frac{(x-8)}{2})$ M1 for $(\frac{2\times5-(x-8)}{2})(\frac{2\times5+(x-8)}{2})$ A1 for $\dfrac{(18-x)(x+2)}{4}$

Paper 5538/18					
No		**Working**	**Answer**	**Mark**	**Notes**
11	(a)	$\frac{810\pi}{90\pi}$ or 9 $\sqrt{9}$ or 3	12	3	M1 for $\frac{810\pi}{90\pi}$ or 9 or $\frac{1}{9}$ or 1:9 oe M1 for $\sqrt{\frac{810\pi}{90\pi}}$ or $\sqrt{9}$ or 3 or $\frac{1}{3}$ or $\sqrt{9} : \sqrt{1}$ oe A1 cao (SC:B1 for answer of 36)
	(b)	3^3 or 27 or 2700	2700π	2	M1 for "3"^{3} or 27 or $(\sqrt{9})^3 : (\sqrt{81})^3$ oe or 9^3 A1 cao

Paper 5538/18					
No		**Working**	**Answer**	**Mark**	**Notes**
12	(a)(i)		1	1	B1 cao
	(ii)		8	1	B1 cao
	(iii)	$64^{-\frac{2}{3}} = \frac{1}{64^{\frac{2}{3}}}$ or $64^{-\frac{2}{3}} = (4^2)^{-1}$	$\frac{1}{16}$	2	M1 for knowing negative power is a reciprocal or power of $\frac{1}{3}$ root is a cube root A1 cao for $\frac{1}{16}$
	(b)	$\sqrt{27} = \sqrt{9\times3}$ or $\sqrt{27} = 3\sqrt{3}$ or $\sqrt{27} = 3^{3/2}$	$\frac{5}{2}$ oe	2	M1 for $\sqrt{27} = \sqrt{9\times3}$ or $\sqrt{27} = 3^{3/2}$ A1 for $\frac{5}{2}$ oe **Alternative method** M1 for $9\times27 = 3^{2n}$ A1 for $\frac{5}{2}$ oe
13	(a)(i)		(90, 1)	2	B1 cao could be indicated on diagram
	(ii)		(180, 0)		B1 cao could be indicated on diagram
	(b)(i)		(45, 0)	2	B1 cao could be indicated on diagram
	(ii)		(90, -3)		B1 cao could be indicated on diagram

Paper 5538/18				
No	**Working**	**Answer**	**Mark**	**Notes**
14	$\frac{1}{3}\pi x^2 h = \frac{4}{3}\pi(2x)^3$ $x^2 h = 4 \times 8x^3$	$32x$	3	M1 for substitution in correct formulae M1 dep for correct unsimplified expression eg $h = \frac{\frac{4}{3}\pi(2x)^3}{\frac{1}{3}\pi x^2}$ oe or $h = 8x$ oe A1 for $32x$ cao
15	$n = 21 \times 4$ or $\frac{1}{4} : \frac{1}{6}$ $\frac{1}{6} \times 84$ or $21 \times \frac{2}{3}$	14	3	M1 for $\frac{1}{3} \times \frac{3}{4} (= \frac{1}{4})$ or $\frac{2}{3} \times \frac{1}{4} (= \frac{1}{6})$ M1 for $21 \times 4 (= 84)$ or $\frac{21}{3} \times 2$ A1 cao [SC:B2 for answer of 63]