AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Free-Standing Mathematics Qualification

Handling and Interpreting Data 6986/2

Mark Scheme

2007 examination – January series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Key to mark scheme and abbreviations used in marking

M	mark is for method
m or dM	mark is dependent on one or more M marks and is for method
A	mark is dependent on M or m marks and is for accuracy
B	mark is independent of M or m marks and is for method and accuracy
E	mark is for explanation

√ or ft or F	follow through from previous incorrect result	MC	mis-copy
CAO	correct answer only	MR	mis-read
CSO	correct solution only	RA	required accuracy
AWFW	anything which falls within	FW	further work
AWRT	anything which rounds to	ISW	ignore subsequent work
ACF	any correct form	FIW	from incorrect work
AG	answer given	BOD	given benefit of doubt
SC	special case	WR	work replaced by candidate
OE	or equivalent	FB	formulae book
A2,1	2 or 1 (or 0) accuracy marks	NOS	not on scheme
$-x$ EE	deduct x marks for each error	G	graph
NMS	no method shown	c	candidate
PI	possibly implied	sf	significant figure(s)
SCA	substantially correct approach	dp	decimal place(s)

No Method Shown

Where the question specifically requires a particular method to be used, we must usually see evidence of use of this method for any marks to be awarded. However, there are situations in some units where part marks would be appropriate, particularly when similar techniques are involved. Your Principal Examiner will alert you to these and details will be provided on the mark scheme.

Where the answer can be reasonably obtained without showing working and it is very unlikely that the correct answer can be obtained by using an incorrect method, we must award **full marks**. However, the obvious penalty to candidates showing no working is that incorrect answers, however close, earn **no marks**.

Where a question asks the candidate to state or write down a result, no method need be shown for full marks.

Where the permitted calculator has functions which reasonably allow the solution of the question directly, the correct answer without working earns **full marks**, unless it is given to less than the degree of accuracy accepted in the mark scheme, when it gains **no marks**.

Otherwise we require evidence of a correct method for any marks to be awarded.

Jan 07

Free Standing Mathematics Qualification

Handling and Interpreting Data (6986)

Answers and Marking Scheme – January 2007

Question 1

(a)(i)	Mean is $\frac{4507}{5}$ = 901.4 square miles	M1 A1	Either
(ii)	Mean is $\frac{4.81}{5}$ = 0.962 million	A1	Accept 0.96 million
(b)	Suitable scaling	B1	0 if all points cannot be plotted
	Plotting points	B2	B1 for 3 correct
(c)	Plot mean point	B1	
	Suitable line	B1	
(d)	0. 76 million	M1 A1	Allow 0.72 to 0.78
	TOTAL	**10**	

Question 2

Mileage *m* (in thousands of miles)	Number of tyres	Class interval	Frequency density
$0 < m \le 20$	0	20	0
$20 < m \le 30$	21	10	2.1
$30 < m \le 40$	41	10	4.1
$40 < m \le 45$	45	5	9
$45 < m \le 50$	11	5	2.2
$50 < m \le 60$	2	10	0.2
$m > 60$	0		0

(a)	Class interval	M1	
	Frequency density	M1 A1	
	Drawing histogram	A1	Condone not labelling axes. Heights within 1 small square
(b)(i)	Number of tyres over 45 000 is 13	B1	
(ii)	Number is $11 + \frac{3}{5} \times 45$	M1	
	= 38	A1	
	TOTAL	**7**	

Question 3

(a)	Cumulative frequencies 0, 9, 33, 60, 77, 79, 80	**B1**	
	Plot at upper values	**B1**	Accept plotting at 15 or 15.5 etc
	Plot points accurately	**B1**	
	Draw curve	**B1**	Scale 0-10, 11-15 etc. Total B1 for drawing curve.
(b)(i)	21	**M1A1**	M1 for 20 or 22 or ft Must be from a cumulative frequency curve
(ii)	18 or 17	**B1**	
(iii)	25.5 (24 or 25)	**B1**	
(iv)	25.5 –18 = 7.5	**B1 ft**	
(c)	Median	**B1**	
	Quartiles	**B1**	
	Whiskers	**B1**	
(d)	Median higher for second play	**B1**	Oe **Max B2**
	LQ higher for second play	**B1**	
	UQ higher for second play	**B1**	
	Whisker ends at 50	**B1**	
	TOTAL	**14**	

Question 4

	A	B	C	D	E	F
1	**Country**	**Contributions to the EU (in £ billion)**	**Received from the EU (in £ billion)**	**Net payment (in £ billion)**	**Net payment to the EU per head (in £)**	**Population (million)**
2	France	10	8.7	1.3	21.7	59.9
3	Germany	11.9	7.9	4	48.5	82.5
4	Portugal	0.8	3.0	-2.2	-209.5	10.5
5	Spain	5	11	-6	-141.8	42.3
6	United Kingdom	6.3	4.8	1.5	25.1	59.8

(a)	Column D	**B1**	
	Any population	**M1 A1**	Delete 1 for consistent dp error
	All of column E	**A1**	
	Population to nearest 100 000	**B1**	Condone 2 out by 1dp Dependent on M1
(b)	$\dfrac{D4}{E4}$	**B1**	Accept $\dfrac{D4}{E4} \times 1000$
	TOTAL	**6**	

Question 5

(a)	Angle is 58°	**B1**	Allow 56° – 60°
	$\frac{58}{360} \times 714\,000$	**M1**	
	115 000	**A1**	Accept 111 000 to 119 000
(b)	Radii are 2cm and 5cm	**B1**	
	∴ Areas are 4 **:** 25	**M1**	
	∴ total number of visitors $= \frac{25}{4} \times 714\,000$	**M1**	
	= 4.46 million	**A1**	Accept 4.4625 million
(c)	$\frac{125}{360} \times 4.46$ million	**M1**	
	1.548 million	**A1**	Accept 1.55 and 1.549 million
	TOTAL	**9**	

Question 6

	Decimal point is incorrect for the bar for 'Chamber of Secrets'.	**B2**	Difficult to interpret B1 Or incorrect bar height B1 Estimate only for Half Blood Prince B1
	TOTAL	**2**	

Question 7

	Data is calculated for height whereas area is expected to be the constant measurement.	**B2**	Accept no scale for B1 Unclear because of width B1
	TOTAL	**2**	
	TOTAL MARK FOR PAPER	**50**	