



## Free-Standing Mathematics Qualification

# Handling and Interpreting Data *6986/2*

## Mark Scheme

### *2006 examination – June 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	OE	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)

### Application of Mark Scheme

#### **No method shown:**

Correct answer without working  
 Incorrect answer without working

mark as in scheme  
 zero marks unless specified otherwise

#### **More than one method / choice of solution:**

2 or more complete attempts, neither/none crossed out

mark both/all fully and award the mean  
 mark rounded down

1 complete and 1 partial attempt, neither crossed out

award credit for the complete solution only

#### **Crossed out work**

do not mark unless it has not been replaced

**Alternative solution** using a correct or partially correct method

award method and accuracy marks as  
 appropriate

**Free-Standing Mathematics Qualification****Intermediate Level – Handling and Interpreting Data (6986/2)****Answers and Marking Scheme****Question 1**

<b>(a)(i)</b>	Mean of lengths = $\frac{226.3}{5}$	<b>M1</b>	
	= 45.3	<b>A1</b>	Accept 45.26
<b>(ii)</b>	Mean = $\frac{956}{5}$	<b>M1</b>	
	= 191	<b>A1</b>	Accept 191.2
<b>(b)</b>	Plotting points	<b>B2</b>	
	Suitable scale	<b>B1</b>	
<b>(c)</b>	Plot mean point	<b>B1</b>	
	Draw line	<b>B1</b>	
<b>(d)</b>	205	<b>B1</b>	Accept 204 and 206 ( 200 – 210 only B1 in (c) )
	<b>TOTAL</b>	<b>10</b>	

**Question 2**

<b>(a)</b>	Cumulative frequency 0, 3, 11, 29, 36, 40	<b>B1</b>	Condone 0 for 351+ in cf
	Plot at upper values	<b>B1</b>	
	Accuracy of plots	<b>B1</b>	
	Smooth curve	<b>B1</b>	
	Suitable scales used	<b>B1</b>	If range used for scale, max B3
<b>(b)(i)</b>	Median is 20 <sup>th</sup> or 20 ½ value	<b>M1</b>	
	= 225	<b>A1</b>	
<b>(ii)</b>	195	<b>B1</b>	
<b>(iii)</b>	258	<b>B1</b>	Accept 255, 256, 257
<b>(iv)</b>	63	<b>B1 ft</b>	(ft unless used 'y' axis results)
<b>(c)</b>	Median	<b>B1</b>	
	Quartiles	<b>B1</b>	
	Whiskers	<b>B1</b>	B1 only for whiskers, median, quartiles in badly scaled grid
	<b>TOTAL</b>	<b>13</b>	

**Question 3**

<b>(a)</b>	Angle is $65^\circ$	<b>B1</b>	Accept 63 – 67
	Number is $\frac{65}{360} \times 38.7$ (million)	<b>M1</b>	
	= 6.9875 million	<b>A1</b>	Accept 7million
<b>(b)(i)</b>	Radii of circles are 6 cm and 2 cm	<b>B1 B1</b>	
	Areas are in the ratio of 9 : 1	<b>M1</b>	
	1971 number is $\frac{1}{9} \times 38.7$ million	<b>M1</b>	
	= 4.3 million	<b>A1</b>	
<b>(ii)</b>	Number is $\frac{58}{360} \times 4.3$ million	<b>M1 ft</b>	
	= 0.693 million	<b>A1 ft</b>	Accept 690 000 and 700 000
<b>(iii)</b>	USA	<b>B2</b>	B1 for Greece or France
	<b>TOTAL</b>	<b>12</b>	

**Question 4**

Police force	Numbers of fixed penalty tickets	Numbers of court cases	Total number of fines for speeding	Percentage who were fined after a court case
Essex	199 201	14 660	213 861	6.85
Lancashire	158 163	3895	162 058	2.40
Thames Valley	121 677	11 086	132 763	8.35
Derbyshire	71 965	3754	75 719	4.96
South Wales	61 948	2015	63 963	3.15
Metropolitan	53 334	7635	60 969	12.52
Northamptonshire	60 459	230	60 689	0.38

<b>(a)(i)</b>	Column D	<b>B1</b>	Allow 1 incorrect (see below)
<b>(ii)</b>	Any in column E	<b>M1 A1</b>	
	Other values in E	<b>A1</b>	Allow 1 incorrect (see below)
	Use of 2 dp	<b>B1</b>	Need 4 correct
<b>(b)</b>	B4 + C4	<b>B1</b>	(Max 5 if not all correct) but accept 1 percentage. 0–1 incorrect
	<b>TOTAL</b>	<b>6</b>	

**Question 5**

<b>(a)</b>	$120 \times 0.9$	<b>M1</b>	
	= 108	<b>A1</b>	
<b>(b)</b>	$1 - 0.9$	<b>M1</b>	
	= 0.1	<b>A1</b>	
<b>(c)</b>	$\frac{72}{180} \times 100$	<b>M1</b>	
	= 40%	<b>A1</b>	
	<b>TOTAL</b>	<b>6</b>	

**Question 6**

<b>(a)</b>	Vertical scale too small	<b>B1</b>	Too cramped or too squashed Axes not labelled - unclear
<b>(b)</b>	Data given has no comment on demand	<b>B2</b>	For any one B1 for drop (only) B1 NY etc. has increased (B1 for drop or steady + B1 comment not true)
	Data shows significant drop between 2001 and 2002 and virtually no subsequent increase		
	<b>TOTAL</b>	<b>3</b>	
	<b>GRAND TOTAL</b>	<b>50</b>	