



## **Free-Standing Mathematics Qualification**

# **Handling and Interpreting Data 6986/2**

*Intermediate Level*

## **Mark Scheme**

*2008 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.

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## 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

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**Intermediate Level – Handling and Interpreting Data 6986**

**Answers and Marking Scheme - January 2008**

**Question 1**

<b>(a)(i)</b>	Mean is $\frac{47.7}{5} = 9.54\%$	<b>M1A1</b>	Either
<b>(a)(ii)</b>	Mean is $\frac{128.8}{5} = 25.8$ minutes	<b>A1</b>	Accept 25.76
<b>(b)</b>	Suitable scaling Plotting points	<b>B1</b> <b>B2</b>	B1 for 3 correct
<b>(c)</b>	Plot mean point Suitable line	<b>B1</b> <b>B1</b>	
<b>(d)</b>	11 %	<b>B2</b>	Accept 10.5-11.5% B1 10-12
	<b>TOTAL</b>	<b>10</b>	

**Question 2**

Amount spent, £ $a$	Number of customers	Class interval	Frequency density
$0.00 < a \leq 10.00$	3	10	0.3
$10.00 < a \leq 20.00$	12	10	1.2
$20.00 < a \leq 30.00$	10	10	1
$30.00 < a \leq 35.00$	15	5	3
$35.00 < a \leq 40.00$	24	5	4.8
$40.00 < a \leq 50.00$	29	10	2.9
$50.00 < a \leq 60.00$	18	10	1.8
$60.00 < a \leq 80.00$	22	20	1.1
$80.00 < a \leq 90.00$	10	10	1
$90.00 < a \leq 100.00$	5	10	0.5
$100.00 < a \leq 110.00$	2	10	0.2
Over 110	0		

<b>(a)</b>		<b>M1</b> <b>M1A1</b> <b>A1</b> <b>B1</b>	Class interval Frequency density Drawing histogram Labelling axes, suitable scale
<b>(b)(i)</b>	Number of people who spent £30 or less is $3 + 12 + 10 = 25$	<b>B1</b>	
<b>(b)(ii)</b>	Number of people spending over £70 is  $17 + \frac{1}{2} \times 22$  $= 28$	<b>M1</b>  <b>B1</b> <b>A1</b>	$\frac{1}{2} \times 22$  17
	<b>TOTAL</b>	<b>9</b>	

**Question 3**

<b>(a)</b>	8 parts No who bought milk is $\frac{3}{8} \times 800$ = 300	<b>B1</b> <b>M1</b> <b>A1</b>	SC2 500
<b>(b)</b>	Female $\frac{3}{5} \times 250$ = 150	<b>M1</b> <b>A1</b>	<b>OR</b> Male is $\frac{2}{5} \times 250$ = 100 M1 ∴ Female is 150 A1
	<b>TOTAL</b>	<b>5</b>	

**Question 4**

<b>(a)</b>	Cumulative frequency 1, 6, 14, 30, 54, 83, 105, 113, 118, 120 Plot at upper values Accuracy of plots Smooth curve	<b>B1</b> <b>B1</b> <b>B1</b> <b>B1</b>	Condone 'over 700, 0'
<b>(b)(i)</b>	Median is 60 <sup>th</sup> value = 460	<b>M1</b> <b>A1</b>	Accept 450 to 465
<b>(b)(ii)</b>	400	<b>B1</b>	Accept 400 to 410
<b>(b)(iii)</b>	510	<b>B1</b>	Accept 505 to 520
<b>(b)(iv)</b>	110	<b>B1ft</b>	
<b>(c)</b>	Median Quartiles Whiskers	<b>B1</b> <b>B1</b> <b>B1</b>	
<b>(d)</b>	Median of second group is smaller Maximum whisker of second group is smaller at 600 Interquartile range is smaller for 2 <sup>nd</sup> group All quartiles of second group are smaller. Both groups have the same minimum time	<b>B1</b> <b>B1</b> <b>(B1)</b> <b>(B1)</b> <b>(B1)</b>	Or vice versa Or vice versa Maximum B2
	<b>TOTAL</b>	<b>14</b>	

**Question 5**

<b>(a)</b>	Angle for black and white is $\frac{0.1}{24.7} \times 360^\circ$ = 1.457...° = 1.46°	<b>M1</b> <b>A1</b> <b>B1</b>	<b>SC2</b> 1.45°
<b>(b)</b>	Radii are 6 cm and 5 cm $\therefore$ Areas are $6^2:5^2$ Number in 1973 = $\frac{25}{36} \times 24.7$ = 17.15... million	<b>B1</b> <b>M1</b> <b>M1</b> <b>A1</b>	Accept diameters 12 and 10 cm
<b>(c)</b>	Number is $\frac{69}{360} \times 17.15$ million = 3.29 million	<b>M1</b> <b>A1</b>	$69 \pm 2^\circ$ ft dep on M1 in (b)
	<b>TOTAL</b>	<b>9</b>	

**Question 6**

<b>(a)</b>	Clearly shows the data for the number of aircraft No key	<b>B1</b> <b>(B1)</b>	<b>Max B1</b>
<b>(b)</b>	No key Number of blocks does not appear to match the actual numbers	<b>B1</b> <b>B1</b>	Needs specific comment eg. Easyjet and Ryanair – same number of suitcases, different number of passengers
	<b>TOTAL</b>	<b>3</b>	
	<b>TOTAL MARK FOR PAPER</b>	<b>50</b>	