



General Certificate of Secondary Education

Statistics 3311

Foundation Tier

Mark Scheme

2008 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.

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The following abbreviations are used on the mark scheme:

- M** Method marks awarded for a correct method.
- A** Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
- B** Marks awarded independent of method.
- M dep** A method mark which is dependent on a previous method mark being awarded.
- ft** Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
- SC** Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.
- oe** Or equivalent.
- eeoo** Each error or omission.

Foundation Tier

Q	Answer	Mark	Comments
1(a)	40	B1	
1(b)	25	B1	
1(c)(i)	100 – (their 40 + their 25 + 5 + 10)	M1	oe
	20	A1ft	ft Only on their ‘40’ and ‘25’
1(c)(ii)	Bar to height 5 for France	B1	Condone inconsistent widths but not bars joined
	Bar to their UK height for UK	B1ft	Correct answer or follow through
2	All 5 pairs correct	B3	B2 Any 3 or 4 correct B1 Any 1 or 2 correct Impossible 0 Likely 0.7 Certain 1 Unlikely 0.25 Even chance 0.5
3(a)	$x - 3 = 10$	M1	oe eg, 10 + 3
	13	A1	
3(b)	7	B1	Accept 5.5 if answer to 3(a) is 1
3(c)	No, as every number is different	B1	oe

Q	Answer	Mark	Comments
4(a)	C (people)	B1	
4(b)(i)	A = 7	B1	
	B = 4	B1	
4(b)(ii)	0.7	B1ft	oe Their $\frac{A}{10}$, 7 in 10, 7 out of 10, 7 to 10 Condone 7:10 or 10:7
4(b)(iii)	Small sample	B1	oe
	All data collected at same time	B1	oe B1 Errors in logging / people might be missed Non - random arrival
4(c)	Are you a teenager?	B1	oe eg, What is your age?
	Yes / No	B1	oe eg, appropriate age groups, must have 13 - 19 oe without overlaps but ignore errors outside 13 - 19
5(a)	8	B1	
5(b)	Attempts to add frequency column	M1	Award if 100 – 150 at base of frequency column
	125	A1	
5(c)	$\frac{875}{\text{Their } 125}$	M1	
	7	A1ft	
5(d)	41, 50, 22	B1, B1, B1	
5(e)(i)	Shows all data	B1	oe See additional guidance
5(e)(ii)	Easier to get an overview of data	B1	oe Easier to work with / easier to read quicker/easier to find information/averages/mean etc

Q	Answer	Mark	Comments
6(a)	Stem 3, 4, 5, 6	B1	
	Leaves 2 3 4 5 8 9 1 3 5 6 6 8 0 1 1 1 7 8 2 5	B2	-1 each error or omission Counted unordered as one error
	Key completed correctly	B1	eg, 3 2 represents 32
7(a)	$\frac{24}{6000}$	M1	
	$\times 1000$	M1dep	M2 $\frac{24}{6}$
	4	A1	Accept 0.4% but 4% is A0
7(b)	$\frac{10}{8} (= 1.25)$	M1	$\frac{2}{8} (= 0.25)$
	$\frac{10}{8} \times 100$	M1dep	$\frac{2}{8} \times 100 + 100$
	125	A1	SC1 112.5 or 111.1 (or better) OR Count 2006 using 2005 as base or 2007 using 2006 as base as a misread.

Q	Answer	Mark	Comments
8(a)	Plot cfs at upper bounds (2, 7, 10, 22, 41, 58, 60)	B1	Allow 0.9 – 1 as upper bound (no further tolerance)
	Correct heights	B1	No need to join back to (0,0)
	Joined with attempts at straight lines	B1	
8(b)	Their 50 AND their 32 read from their graph	B1	Tolerance of ± 1
	Subtraction of their readings from $4\frac{1}{2}$ and $5\frac{1}{2}$	M1	
	Their 18	A1	If answer only given – check graph, answer must be within 1. Award 0 or 3
Alt 8(b)	Subtracts cfs to get frequencies for less than 6	M1	
	Half of Their 19 + half of Their 17	M1	
	17, 18 or 19	A1	Allowing for possible rounding

Q	Answer	Mark	Comments																																																	
9(a)(i)	$\frac{1}{6}$	B1	oe Rounding on decimals or % must be correct unless deemed further work																																																	
9(a)(ii)	$\frac{1}{2}$	B1	oe																																																	
9(b)(i)	<table border="1"> <tr> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> </tr> <tr> <td>2</td> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>10</td> <td>12</td> </tr> <tr> <td>3</td> <td>3</td> <td>6</td> <td>9</td> <td>12</td> <td>15</td> <td>18</td> </tr> <tr> <td>4</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>20</td> <td>24</td> </tr> <tr> <td>5</td> <td>5</td> <td>10</td> <td>15</td> <td>20</td> <td>25</td> <td>30</td> </tr> </table>		1	2	3	4	5	6	0	0	0	0	0	0	0	1	1	2	3	4	5	6	2	2	4	6	8	10	12	3	3	6	9	12	15	18	4	4	8	12	16	20	24	5	5	10	15	20	25	30	B2	See below -1 each error or omission Count $\times 0 \neq 0$ repeated as 1 error
	1	2	3	4	5	6																																														
0	0	0	0	0	0	0																																														
1	1	2	3	4	5	6																																														
2	2	4	6	8	10	12																																														
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4	4	8	12	16	20	24																																														
5	5	10	15	20	25	30																																														
9(b)(ii)	Explains that there are 9 values of 15 or more	B2	B1 Identifies (possibly in table) their scores of 15 and above (no need to list repeats) B1 $\frac{9}{36}$ Condone for B2 $\frac{9}{36} = \frac{1}{4}$ or $\frac{1}{4}$ of 36 = 9 For B1 can follow through incorrect table but only B2ft if recovered																																																	
10(a)(i)	Plots remaining 6 points	B2	-1 each error or omission																																																	
10(a)(ii)	No correlation in data	B1	oe See alternative response sheet																																																	
10(b)(i)	Positive	B1	oe Ignore references to strength																																																	
10(b)(ii)	Line through plotted (4, 5) positive gradient	B1																																																		
	Line at least from $x = 1$ to $x = 8$ and within tolerance	A1	Tolerance 'gates' are (1, 0.5) to (1, 1.5) and (7, 8.4) to (7, 9.2)																																																	
10(b)(iii)	8	B1ft	ft																																																	

Q	Answer	Mark	Comments
11(a)	23	B1	
11(b)	West Midlands	B1	
11(c)	Rounding	B1	Accept rounding errors, mistakes caused by rounding; not accept that the rounding is wrong or error in rounding
11(d)	$\frac{78}{100} \times 160 = 124.8$	B1 B1	Sight of 78% oe B1 Not 78 160 or 160 000 B1
	124 800	B1	124.8 SC2; 125 000 SC2; 125 SC1
11(e)	Correct heights	B1	80 17 3
	Layout (rectangles joined)	B1	For consistency with previous charts
	Shading/key	B1	Allow if key written on each rectangle
11(f)	Wales highest % over 12 months	B1	Must imply % or proportion not number or amount
	Scotland highest % under 6 months	B1	

Q	Answer	Mark	Comments
12(a)	Only females	B1	Too small a sample B0; biased B0 ref. to stratification B0 No females in house B0
	Restricted house types/cost (only those costing £450 000)	B1	
12(b)(i)	Select random numbers in the range 01 – 500	B1	Use of tables / computer generated data: For hat selection ; 500 numbers in a hat B1 Pick out 50 B1
	Match random numbers to list	B1	
12(b)(ii)	Improve representativeness of sample	B1	Fair amount B1 Fair amount of each type B1 Fairer B0
12(b)(iii)	$\frac{100}{500} \times 50 = 10$	M1, A1	M1 For 100 or $99/500 \times 50$ A1 For correct method and answer 9.9 M1 A0
12(c)(i)	Overlapping limits / no instructions	B1	Unequal intervals B0 Do not have a mortgage B1 for either part but not both
12(c)(ii)	Personal	B1	Biased B0 ; people may not pay monthly or it may vary B1

13(a)	£3 300	B1	
13(b)	$£25\,700 - £24\,700 = £1\,000$	M1, A1	25.7 – 24.7 M1
13(c)	Median	B1	£25 000
	Quartiles in box	B1	£23 400 – 26 500
	Tails	B1	£22 300 – 26 900 Must be on grid
13(d)(i)	North West	B1	
13(d)(ii)	North East. below median	B1	Accept md. = £24 800
	West Mids. Range too large	B1	Range = £4 600; has large range B0

Q	Answer	Mark	Comments
14(a)(i)	$\frac{45}{150}$	B1	$\frac{3}{10}$ or .3
14(a)(ii)	$\frac{95}{150}$	M1, A1	$\frac{19}{30}$ or 0.63($\dot{3}$) Sight of 95 or 22 + 25 + 48 M1
14(a)(iii)	150 – (22 + 12 + 25 + 5 + 6 + 10 + 48)	M1	
	$\frac{\textit{Their 22}}{150}$	M1 dep	
	$\frac{22}{150}$	A1	$\frac{11}{75}$ or 0.146($\dot{6}$) min 2 d.p
14(a)(iv)	$\frac{59}{150}$	M1	For sight of 59 or 22 + 12 + 25
		A1	0.393($\dot{3}$) 2 d.p
14(b)(i)	Discrete	B1	
14(b)(ii)	Continuous	B1	