



**General Certificate of Secondary Education
June 2013**

Statistics

43101F

(Specification 4310)

Unit 1: Statistics Written Paper (Foundation)

Final Mark Scheme

Mark Scheme

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 events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised 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 students' 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.

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Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

- M** Method marks are awarded for a correct method which could lead to a correct answer.
- M Dep** A method mark dependent on a previous method mark being awarded.
- A** Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
- B** Marks awarded independent of method.
- B Dep** A mark that can only be awarded if a previous independent mark has been awarded.
- E** Explain marks are awarded for a full and detailed explanation
- ft** Follow through marks. Marks awarded following a mistake in an earlier step.
- SC** Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
- oe** Or equivalent. Accept answers that are equivalent.
eg, accept 0.5 as well as $\frac{1}{2}$
- [a, b]** Accept values between *a* and *b* inclusive.

Unit 1 Foundation Tier

Q	Answer	Mark	Comments
1(a)	Toy	B1	
1(b)	0.65 + 0.2	M1	oe
	0.85	A1	oe
1(c)	1 – 0.1(0)	M1	oe eg 0.65 + 0.2(0) + 0.05
	0.9	A1	oe
1(d)	100 × any probability from table	M1	oe
	5	A1	
2(a)	Uses an appropriate tallying method with five bar gate seen	M1	
	Tallies correct	A1	I II III IIII IIII II II
	Frequencies correct or correct for their tallies	B1 ft	1, 2, 3, 12, 2 if correct
2(b)	Fully correct or ft their table (must include at least one half circle)	B3 ft	B2 ft 3 or 4 rows correct including at least one half circle B1 ft 1 or 2 rows correct
2(c)	10 (p)	B1 ft	oe ft or correct
2(d)	One correct product	M1	10 × 7 (= 70 (p)) or 20 × 5 (= 100 (p))
	Attempts to add their five total values	M1	
	£2.05 or 205 p or 205	A1	SC1 8.2 (no working) Do not accept incorrect money notation eg, £ 205 is M2A0

Q	Answer	Mark	Comments
3(a)	6	B1	
3(b)	13	B1	Accept [12.8 – 13.2]
3(c)	All heights correct	B2	B1 One height correct (ignore structure for this B2/B1)
	Each day has a joined pair of bars in the correct order	B1	
	Equal gap between all the different days' bars	B1	
3(d)	W(ednesday)	B1	
3(e)(i)	0	B1	oe eg zero
3(e)(ii)	3 or $\frac{3}{n}$ ($n \geq 4$) or Mon, Tues, Weds	M1	Not 3 as a denominator
	$\frac{3}{5}$	A1	oe SC1 0.3 or 30%
4(a)	A small scale version of the main study	B1	oe
4(b)	To test question wording, collection methods or response rate	B1	oe
4(c)(i)	2	B1	
4(c)(ii)	120 identified	B1	Accept 7 or 7 th (oe)
	It is a lot bigger than any other value	B1dep	oe
4(d)	Gender	B1	oe
5(a)	To save time/effort	B1	oe
5(b)	Number all of the population	B1	oe
	Use random numbers to obtain sample	B1	oe

Q	Answer	Mark	Comments												
6	Both medians correct or both means correct or both totals correct and both ranges correct and no errors seen and correct comparison of a correct average or the correct total and correct comparison of correct range	B5	If you cannot award B5 go to alternate mark scheme and award marks up to a maximum of B4												
Alternate mark scheme															
6	Both means correct or both medians correct or both totals correct	B2	B1 Any one of these values correct <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Mean</th> <th>Median</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>Sam</td> <td>28</td> <td>25</td> <td></td> </tr> <tr> <td>Tom</td> <td>28</td> <td>25</td> <td></td> </tr> </tbody> </table>		Mean	Median	Range	Sam	28	25		Tom	28	25	
		Mean	Median	Range											
	Sam	28	25												
	Tom	28	25												
Either range correct	B1	<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>Sam</td> <td></td> <td></td> <td>35</td> </tr> <tr> <td>Tom</td> <td></td> <td></td> <td>19</td> </tr> </tbody> </table>	Sam			35	Tom			19					
Sam			35												
Tom			19												
Correct comparison for their chosen average and values	B1 ft	eg, They have the same average mark													
Correct comparison for their values of range	B1 ft	eg, Tom's scores are more consistent													
7	BEDCA	B2	B1 BE ... or CA												
8(a)	Some people will own a cat and a dog	B1	oe												
8(b)	0.248	B1	Accept [0.24, 0.25]												
8(c)	Sight of 3.3 or 1.7	M1													
	5(.0)	A1													
8(d)	Higher percentage of people own a cat compared to dog	B1	oe (refers to 1st table)												
	Percentage owning more cats is greater	B1	oe (refers to 2nd and 3rd tables) eg % owning more dogs is lower												

Q	Answer	Mark	Comments
9(a)(i)	1925	B1	
9(a)(ii)	Primary and continuous	B2	None incorrect B1 One or two correct and one incorrect
9(a)(iii)	Measurement and experiment	B2	None incorrect B1 One or two correct and one incorrect
9(b)	All plots correct	B2	B1 Four or five plots correct
	Their plots joined	B1 ft	Straight or dotted line Not dependent on previous marks but at least four points joined
10(a)(i)	12.5 and 17.5	B1	
10(a)(ii)	Plotted at correct midpoints ft	B1	ft Their table or correct
	Plotted at correct frequencies	B1	
	Their 4 plots joined	B1	Ignore work before 1 st and after last plot
10(b)	Pet ducks live longer than wild ducks (on average)	B1	oe eg, compare modes
	Pet ducks live to more varied ages	B1	oe eg, compare ranges
11(a)	Digits 63 ÷ digit 6	M1	Can be implied by digits 105
	10.5 or $10\frac{1}{2}$	A1	oe SC1 $\frac{21}{2000}$
11(b)	Circles births and says that the birth rate is higher than the death rate	B1 ft	or circles births with value of 48 seen for number of deaths
12(a)	Percent(age) or %	B1	Accept deviation / difference (from mean of zero) Ignore other words if correct one(s) seen
12(b)	As the point (for 2010) is below the x axis	B1	oe
12(c)	Increases circled	B1	Accept any indication

Q	Answer	Mark	Comments
13(a)	Four correct points	B2	B1 Two or three correct points
13(b)(i)	$(7.2 + 6.6 \dots) / 8$ or $\frac{39.2}{8}$	M1	Indication of adding and then dividing by 8
	4.9	A1	SC1 37.1
13(b)(ii)	Their double mean plotted	M1	ft Their 4.9
	Straight line through plotted double mean through gate of (5, 6.5) to (5, 8) and as far as 46 on x axis	A1	
13(c)	Correct value from their line	B1 ft	Their line must have negative gradient B0 If no line
13(d)	Extend their line to tread of 1.6	M1	
	Correct value from their line	A1 ft	SC1 No extension to line, or no line at all but value [50, 60] given
13(e)	Ticks 13(c) and references interpolation	B1	Allow any indication (for ticking) oe for interpolation
13(f)	Yes ticked and the further travelled will cause more wear on the tyre (and therefore less tread)	B1	Oe must reference cause or equivalent