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General Certificate of Secondary Education
June 2011

Mathematics 43601F
Foundation
Unit 1

Final

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 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.

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The following abbreviations are used on the mark scheme:

M	Method marks awarded for a correct method.
M dep	A method mark which is dependent on a previous method mark being awarded.
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.
Q	Marks awarded for quality of written communication.
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.
[*a*, *b*]	Accept values between a and b inclusive.

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1ai	4, 3, 12, 9	B2	B1 three correct
	28	B1 ft	ft frequencies or correct from tallies
1aii	$\frac{\text{their 4}}{\text{their 28}}$	B1 ft	oe
	$\frac{1}{7}$	B1 ft	ft correct cancelling of any fraction
1b	Symbol represents 2 birds	B1	
	Correct number of symbols for blackbird (3) starling $\left(2\frac{1}{2}\right)$ sparrow $\left(1\frac{1}{2}\right)$	B2 ft	ft their key or correct (not symbol = 1 unless 2 more symbols added in robin row) B1 ft for one or two rows correct Allow half bird cut anywhere
	Their completed pictogram, symbols aligned	Q1	Strand (ii) Logical organised working
1c	8 000 000	B1	
	8 million ÷ 500 000 or their 8 000 000 ÷ 500 000	M1	oe eg 8 ÷ 0.5 Digits 16 implies M1
	16	A1 ft	ft their 8 000 000 in digits SC1 $\frac{1}{16}$ or 0.0625
1d	blackbird (flies away)	B1	Accept any clear indication eg B, R SC1 answers wrong way round SC1 Robin 4, Blackbird 3
	robin (arrives)	B1	

2	10	B2	B1 92(p) or 82(p) or 72(p) or 20(p) seen SC1 5p, 5p or 2 × 5p

3a	8 (–) 3	M1	
	5	A1	
3b	8 (+) 4 (+) 5 (+) 3	M1	Allow one error or omission
	20	A1	
3c	Fully correct bar chart (heights 10, 2, 5)	B3	B2 2 criteria met B1 1 criteria met ie bars add up to their 20 – 3 Banana (bar) = 2 × orange (bar) Apple bar has height 2

4a	**B** marked at three parts	B1	0 – – B 1
	C marked at 0	B1	
4b	60(°) or $\frac{1}{6}$ seen	B1	±2 or 60 walk or 50 cycle or 90 bus
	$\frac{360}{\text{their } 60} \times 40$	M1	oe their 6×40 or $5 \times 40 + 40$
	240	A1 ft	Accept integer answer in range [232, 249] SC2 Non-integer in range [232, 249]
4c	$\frac{90}{360}$ ($\times$ 252) or $\frac{1}{4}$ ($\times$ 252)	M1	oe
	63	A1	
	Alternative method		
	$40 \times \frac{90}{\text{their } 60} + \frac{252 - \text{their } 240}{4}$	M1	
	63	A1	

5a	(1 + 1 + 10 + 2 + 10 + 1 + 3) ÷ 7 or 1 + 1 + 10 + 2 + 10 + 1 + 3	M1	oe Allow one error or omission
	4 or 28 and 35	A1	
	(range =) 9	B1	Range
	Ed's scores are higher on average **or** Danni's scores are more varied	Q1	oe ft their values for mean or totals or range Strand (iii) Supporting answers with explanation and evidence
	Ed's scores are higher on average (or in total) **and** Danni's scores have bigger range	B1 ft	oe ft their values for mean or totals and range
5b	Danni and valid reason or Ed and valid reason	B1 ft	eg (Danni) only one that scored 10 (Ed) more consistent

6	$1 - \frac{1}{4}$ $\left(=\frac{3}{4}\right)$	B1	24 ÷ 3 (= 8) or 1 : 3
	$24 \div 3 \times 4$	M1	oe their 8 + 24 or $(1 \times) 8 + 3 \times 8$ or 4×8
	32	A1	SC2 $\frac{8}{32}$ or $\frac{24}{32}$

7	$\frac{6}{100}$ × 23.5(0) (= 1.41)	M1	oe
	their 1.41 + 23.5(0) (= 24.91)	M1 dep	oe 1.06 × 23.5(0) M2
	their 24.91 × 4 (= 99.64) or 100 ÷ their 24.91 (= 4.(…))	M1	100 ÷ 4 (= 25)
	Yes and 99.64 or Yes and 4.(…)	A1	Yes and 24.91 (<) 25
	Alternative method 1		
	4 × 23.5(0) (= 94)	M1	
	$\frac{6}{100}$ × their 94 (= 5.64) or 100 – their 94 (= 6)	M1	oe
	their 94 + their 5.64 (= 99.64) or $\frac{\text{their } 6}{\text{their } 94}$ × 100 (= 6.(…))	M1 dep	oe 1.06 × 94 M3 dep on second M1
	Yes and 99.64 or Yes and 6.(…)	A1	
	Alternative method 2		
	100 ÷ 4 (= 25)	M1	
	their 25 – 23.5(0) (= 1.5(0))	M1	
	$\frac{\text{their } 1.5(0)}{23.5(0)}$ × 100 (= 6.(…))	M1	
	Yes and 6.(…)	A1	

8a	80(%) : 20(%) (= 4 : 1) or $\frac{4}{5}$ seen	B1	oe 80 to 20
8b	Rows/columns for History and not History	B1	oe
	Columns/rows for think real and not think real	B1	oe Allow extra column/row for don't know
8c	17 : 3 = 5.(…) : 1 or 17 ÷ 3 (= 5.(…))	M1	oe (4 : 1 =) 12 : 3
	Yes and 5.(…)	A1	Yes and 12 : 3
	Alternative method		
	$\frac{17}{20}$ (= 85(%)) or 85 : 15	M1	80% = $\frac{16}{20}$ or $\frac{17}{20}$ seen
	Yes and 85% or Yes and 85 and 80	A1	Yes and $\frac{17}{20}$ (>) $\frac{16}{20}$

9a	2 × 0.4 (+) 3 × 0.6 (+) 7 × 0.8 (+) 4 × 1.0 (+) 3 × 1.2 (+) 1 × 1.4 (= 17.2) or 0.8(+) 1.8(+) 5.6(+) 4(+) 3.6(+) 1.4 (= 17.2)	M1	Attempt at fx - at least one product seen
	their 17.2 ÷ their (2 + 3 + 7 + 4 + 3 + 1) or their 17.2 ÷ 20	M1 dep	Condone one error or omission in frequencies
	0.86	A1	Ignore further working SC2 [15.8, 15.9] or 0.76 or 0.96 SC1 [2.8, 2.9]
9b	Mention of collecting data about heights of ball bounce on concrete	B1	eg do an experiment dropping (same) balls (from same height) onto concrete and collect data
	Mention of summary statistics, a suitable graph or other calculation for comparison	B1	eg calculate the average heights of the bounces for concrete or plot a frequency polygon of heights on concrete
	Mention of interpreting results or link to given hypothesis	B1	eg compare the averages or compare the graphs