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# General Certificate of Secondary Education
# March 2012

## 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 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.

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**UMS conversion calculator** www.aqa.org.uk/umsconversion

**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. |

**UNIT 1 FOUNDATION TIER 43601F**

| | | | |
|---|---|---|---|
| 1a | (Medium bar =) 20 | B1 | |
| | (Large bar =) 6 | B1 | If structure incorrect (incorrect gaps/unequal widths) award B1 max |
| 1b | 24 or 10 | B1 | Seen (or implied by later work) |
| | their 24 + their 10 (= 34) | M1 dep | dep on B1 |
| | their 34 × 2 | M1 | oe<br>M2 for their 24 × 2 + their 10 × 2 |
| | 68 | A1 | SC3 digits 68 (but not answer = 68)<br>SC3 64<br>SC2 32 |
| | **Alternative method** | | |
| | 24 or 10 | B1 | Seen (or implied by later work) |
| | their 24 × 2 or their 10 × 2 | M1 | |
| | their 48 + their 20 | M1 dep | dep on B1 |
| | 68 | A1 | SC3 digits 68 (but not answer = 68)<br>SC3 64<br>SC2 32 |

| | | | |
|---|---|---|---|
| 2a | Symbol represents 10 members | B1 | |
| | Correct number of symbols for one row<br>Basketball (1)<br>Netball $\left(1\frac{1}{2}\right)$ | M1 | Follow through from their key<br>(not symbol = 1) |
| | Two correct rows | A1 ft | ft wrong key (not symbol = 1) |
| 2b | Suitable headline reflecting data | B1 | Condone any valid statement about results eg<br>Most people do football<br>More do football than all the others in total<br>70 people go to sports clubs |
| 2c | 40 ÷ 5 (= 8) or 40 ÷ 2 (= 20) or 2 × 5 (= 10) | M1 | oe |
| | 4 | A1 | |

| | | | |
|---|---|---|---|
| 3a | 120 – 97 or 89 – 70 + 31 – 27 | M1 | oe or 19 or 4 seen |
| | 23 | A1 | SC1 answer 46 |
| 3b | 15 | B1 | for Wednesday |
| | 24 | B1 | for Thursday |
| 3c | $\frac{30}{120}$ seen | M1 | oe fraction, decimal, percentage |
| | $\frac{1}{4}$ | A1 | SC1 $\frac{15}{43}$<br>SC1 any seen fraction correctly cancelled to simplest form |
| 3d | $\frac{50}{150}$ or attempts to make a comparison | M1 | Seen or implied |
| | $\frac{1}{3}$ or $\left(\frac{1}{4}=\right)$ $\frac{50}{200}$ or both values correct in appropriate comparison | A1 | Fraction/decimal/percentage |
| | Their yes with fractions with either same numerator (oe)<br>or same denominator<br>or with both values as decimals<br>or both values as percentages<br>or appropriate diagrams | Q1 | Strand (iii)<br>Supporting answers with explanations and evidence<br>ft their $\frac{1}{4}$ from 3c and their $\frac{1}{3}$ |
| | **Alternative method** | | |
| | $\frac{150}{4}$ | M1 | May be implied by diagram |
| | 37.5 | A1 | |
| | Yes (50 > 37.5) | Q1 | |

| | | | |
|---|---|---|---|
| 4a | Germany, UK, France | B2 | B1 for one correct: Germany first or UK second or France third<br>B1 30, 28, 8 |
| 4b | 9 | B1 | |
| 4c | (Germany =) 30 + 10 + 6 + 32 (= 78)<br>or<br>(UK =) 28 + 13 + 12 + 23 (= 76)<br>or<br>(France =) 8 + 15 + 9 + 11 (= 43) | M1 | Method for one country seen or implied by correct answer<br>Allow one error per country |
| | (Germany =) 30 + 10 + 6 + 32 (= 78)<br>**and**<br>(UK =) 28 + 13 + 12 + 23 (= 76)<br>(and (France =) 8 + 15 + 9 + 11 (= 43)) | M1 | Method for at least Germany **and** UK seen or implied by correct answer<br>Allow one error per country |
| | Germany = 78 **and** UK = 76<br>(and France = 43)<br>and chooses Germany | A1 | |

| | | | |
|---|---|---|---|
| 5a | $\frac{1}{15}$ | B1 | oe [0.06, 0.07] or [6%, 7%] |
| 5b | $\frac{2}{15}$ | B1 | oe [0.13, 0.14] or [13%, 14%] |
| 5c | $\frac{13}{15}$ | B1 ft | oe ft 1 – their $\frac{2}{15}$ [0.86, 0.87] or [86%, 87%] |

| | | | |
|---|---|---|---|
| 6a | 5 | B1 | |
| 6b | 3 | B2 | B1 one correct trial seen (increasing red and decreasing yellow by same number)<br>or<br>B1 10 red or 9 yellow seen<br>or<br>B1 (12 +/– 7) ÷ 2 or 2.5 or 9.5 |

| | | | |
|---|---|---|---|
| 7a | 10.03 + 9.78 + 10.61 + 12.9(0) + 10.08 (= 53.4) | M1 | Allow one error |
| | $\frac{\text{their } 53.4}{5}$ (= 10.68) | M1 | |
| | 10.68 and Erik | A1 | |
| | **Alternative method** | | |
| | 10.03 + 9.78 + 10.61 + 12.9(0) + 10.08 (= 53.4) | M1 | Allow one error |
| | 10.31 × 5 (= 51.55) | M1 | |
| | 51.55 and 53.4 and Erik | A1 | |
| 7b | 10.31 + 0.34 (= 10.65) | M1 | $\frac{10.03+10.61+10.08}{3}$ (= 10.24) |
| | Oscar and 10.65<br>or Oscar and 10.24 | A1 | |

| | | | |
|---|---|---|---|
| 8a | Stem 4, 5, 6, (7)<br>and suitable key | B1 | |
| | Leaves<br>6 8 9<br>1 2 3 3 5 7 9<br>0 1 4 5<br>2 | B2 | B1 one error<br>Unordered is one error |
| | Stem, leaves and aligned correctly to show distribution | Q1 | Strand (ii)<br>Logical organised working |
| 8b | 55 | B1 ft | ft their stem-and-leaf |
| 8c | 0.05 × their 55 (= 2.75) | M1 | oe their 55 must be < 59 |
| | their 55 + their 2.75 (= 57.75)<br>or<br>59 – their 2.75 (= 56.25) | M1 dep | |
| | Yes and 57.75<br>or Yes and 56.25 | A1 ft | ft their 55 only |
| | **Alternative method 1** | | |
| | 59 – their 55 (= 4) | M1 | their 55 must be < 59 |
| | $\frac{\text{their } 4}{\text{their } 55}$ × 100 (= 7.(…)) | M1 dep | oe |
| | Yes and 7.(…) | A1 ft | ft their 55 only |
| | **Alternative method 2** | | |
| | 0.05 × their 55 (= 2.75)<br>or<br>59 – their 55 (= 4) | M1 | oe their 55 must be < 59 |
| | 0.05 × their 55 (= 2.75)<br>and<br>59 – their 55 (= 4) | M1 dep | oe their 55 must be < 59 |
| | Yes and 2.75 and 4 | A1 ft | ft their 55 only |
| | **Alternative method 3** | | |
| | $\frac{59}{\text{their } 55}$ (× 100) or 1.07(…)<br>or 107.(…) | M1 | oe their 55 must be < 59 |
| | their 1.07(…) – 1<br>or their 107.(…) – 100 | M1 dep | May be implied by correct final answer |
| | Yes and 7.(…) | A1 ft | ft their 55 only |
| | **Alternative method 4** | | |
| | 1.05 seen | M1 | |
| | their 55 × 1.05<br>or 59 ÷ 1.05 | M1 dep | oe their 55 must be < 59 |
| | Yes and 57.75<br>or Yes and 56.(…) | A1 ft | ft their 55 only |

| | | | |
|---|---|---|---|
| 9 | 162 or 108 or 36 or 18 | B1 | ±2 |
| | $\frac{\text{their } 162}{360} \times 100$ (= [44, 46]) | M1 | oe |
| | [44, 46] and Yes | A1 | |
| | **Alternative method 1** | | |
| | 198 (±2) | B1 | 198 (±2) |
| | $\frac{\text{their } 198}{360} \times 100$ (= [54, 56]) | M1 | oe $\frac{\text{their } 198}{360} \times 100$ (= [54, 56]) |
| | [54, 56] and 60 and Yes | A1 | [54, 56] and 45 and Yes |
| | **Alternative method 2** | | |
| | 162 or 108 or 36 or 18 | B1 | ±2 |
| | 0.4 × 360 (= 144) | M1 | oe |
| | 144 and [160, 164] and Yes | A1 | |
| | **Alternative method 3** | | |
| | 198 | B1 | ±2 |
| | 0.6 × 360 (= 216) | M1 | oe |
| | 216 and [196, 200] and Yes | A1 | |
| | **Alternative method 4** | | |
| | 30% or 10% or 5% | B1 | ±1% |
| | their 30% + their 10% + their 5% | M1 dep | oe At least one percentage must be in tolerance |
| | [44, 46] and Yes | A1 | |

| | | | |
|---|---|---|---|
| 10 | Total girls = 90 | B1 | |
| | Girls can whistle = 36 | B1 ft | ft $\frac{40}{100} \times$ their 90 |
| | Girls cannot whistle = 54 | B1 ft | ft their 90 – their 36 |
| | Boys can whistle = 24 | B1 ft | ft their 36 ÷ 3 × 2 |
| | Boys cannot whistle = 6 | B1 ft | ft 30 – their 24 |
| | | | Note: if all correct B5:<br><table><tr><td>24</td><td>36</td></tr><tr><td>6</td><td>54</td></tr><tr><td>30</td><td>90</td></tr></table> |