# Mark Scheme (Results)

# Summer 2010

# GCSE Statistics (1389)
# Foundation Paper 1F

NOTES ON MARKING PRINCIPLES

1    Types of mark
     M marks:  method marks
     A marks:  accuracy marks
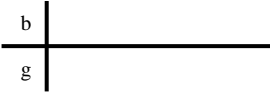     B marks:  unconditional accuracy marks (independent of M marks)

2    Abbreviations
     cao – correct answer only                              ft – follow through
     isw – ignore subsequent working              SC: special case
     oe – or equivalent (and appropriate)        dep – dependent
     indep - independent

3    No working
     If no working is shown then correct answers normally score full marks
     If no working is shown then incorrect (even though nearly correct) answers score no marks.

4    With working
     If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
     If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.
     If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.
     If there is no answer on the answer line then check the working for an obvious answer.
     Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.  Discuss each of these situations with your Team Leader.
     If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

5    Follow through marks
     Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.
     Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6 Ignoring subsequent work
It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.
Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

7 Probability
Probability answers must be given a fractions, percentages or decimals.  If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 Linear equations
Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere).  Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions
Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

10 Range of answers
Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and includes all numbers within the range (e.g 4, 4.1)

| 1389/1F- Section A | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| A1 (a) | | 116 | 1 | B1 for 116 cao |
| (b) | | 16 | 1 | B1 for 16 or 11 |
| (c) | |  | 2 | B1 for b(oys) and g(irls); accept m(ales) and f(emales)<br>B1 (dep) for spaces for separate results |
| A2 (a) | | unlikely | 1 | B1 for unlikely indicated cao |
| (b) | $1-\dfrac{1}{53}$ | $\dfrac{52}{53}$ | 2 | M1 for $1-\dfrac{1}{53}$ or 1 – 0.018(8...) or 100% - 1.8(8...)% seen or implied<br>A1 for $\dfrac{52}{53}$ oe or answer rounding to 0.98 or 98% |
| (c) | $\dfrac{1}{53}\times\dfrac{1}{53}$ | $\dfrac{1}{2809}$ | 2 | M1 for $\dfrac{1}{53}\times\dfrac{1}{53}$ oe or 0.018(8...)×0.018(8...)<br>A1 for $\dfrac{1}{2809}$ oe or answer in the range 0.00032–0.00036 or 0.032%–0.036% |

| 1389/1F – Section A | | | | | |
|---|---|---|---|---|---|
| Question | | Working | Answer | Mark | Notes |
| A3 | (a) | 500 – 1 | 499 | 1 | B1 for 499 oe |
| | (b) | 5 – 2 | 3 | 2 | B2 for 3 oe<br>(B1 for 2–5 or 2 to 5 oe or 2 and 5 identified) |
| | (c) | | Adv.: easy to calculate<br>Dis.: affected by extreme values | 2 | B1 for easy or quick oe<br>B1 for affected by extreme values oe |
| A4 | (a) | | The journeys all took longer in 2008<br>OR<br>It has increased in 2008<br>They have decreased/are shorter | 1 | B1 |
| | (b) | | Reasonable line that lies between both (10, 8) and (10, 20) and also between (70, 68) and (70, 84) | 1 | B1<br>Do not allow line that is not drawn with a ruler and seems to join the points<br>Single line required |
| | (c) | | Any figure in range 68 – 84 inclusive | 1 | B1 |
| | (d) | | Any figure in range 30 – 42 inclusive | 1 | B1 |
| | (e) | | No (may be implied) and<br>100 minutes is a long way outside the data range<br>OR This involves extrapolation | 1 | B1 |

| 1389/1F – Section A | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| A5 | | Any 3 from:<br><br>Scale does not start at 0<br><br>Anything which describes the problems with the vertical scale, e.g. the break in the vertical scale<br><br>Anything which describes that the horizontal scale is poor<br><br>The lines are thick/tubular<br><br>Axes poorly labelled, e.g. 000 tonnes | 3 | B1  B1  B1<br><br>Do not accept that the vertical axis is on the wrong side, or comments criticising the position of the labels – this is common acceptable practice<br><br>Only give 1 mark for the same point being made twice<br>Look out for equivalent statements and two correct misleading statements in one sentence |
| A6  (a)<br><br>(b) | | A<br><br>C | 1<br><br>1 | B1 for A cao<br><br>B1 for C cao |
| A7  (a)<br><br>(b) | $\dfrac{530+678+516+432}{4}$ | 539<br><br>decreasing trend<br>seasonal variation | 2<br><br>2 | M1 for $\dfrac{530+678+516+432}{4}$<br>A1 for 539 or 539.9<br><br>B1 decreasing trend oe<br>B1 for seasonal variation oe or a correct comparison for both years, e.g. less (sparrows) in 2007 than in 2006 |

| 1389/1F – Section B | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| B1     (a) | | Industry | 1 | B1 for Industry cao |
| (b) | | Other users | 1 | B1 for Other (users) cao |
| (c) | | pie chart | 3 | M1 for one correct calculation, e.g. 32/155×360, or implied by one correct angle drawn or seen<br>A2 for pie chart within guidelines and labeled<br>(A1 for one sector drawn correctly and labeled or for pie chart within guidelines and not labeled) |

| 1389/1F – Section B | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| B2 (a) | | <table><tr><td>Length</td><td>Tally</td><td>Frequency</td></tr><tr><td>L</td><td>卌</td><td>5</td></tr><tr><td>M</td><td>卌 III</td><td>8</td></tr><tr><td>S</td><td>卌 II</td><td>7</td></tr></table> | 2 | B2 for correct tallies or frequencies (tallies need not be grouped in fives)<br>(B1 for one correct tally or frequency) |
| (bi) | | M | 3 | B1 for M or ft from their table (accept medium oe) |
| (bii) | | (number line with × between 0 and midpoint) | | B1 for × between 0 and ½ |
| (biii) | | $\dfrac{7}{20}$ | | B1 ft for $\dfrac{7}{20}$ or 0.35 or 35% or ft from their frequency table |
| (c) | | 28 | 1 | B1 for 28 cao |
| (d) | | 30 | 1 | B1 for 30 cao |
| (e) | (8×28 + 7×30 + 3×32 + 2×34)/20 | 29.9 | 3 | M1 for attempt to find 8×28 + 7×30 + 3×32 + 2×34 (condone one error)<br>M1 for Σ$fx$/20<br>A1 cao |
| (f) | | average with sensible reason | 1 | B1 for mean or '29.9' + e.g. uses all the values, OR mode or '28' + e.g. most sold/most popular OR median or '30' + e.g. skewed data |

| 1389/1F – Section B | | | | | |
|---|---|---|---|---|---|
| Question | | Working | Answer | Mark | Notes |
| B3 | (a) | | 1748.4 | 1 | B1 |
| | (b) | 318.8 + 258.1 | 576.9 | 1 | B1 |
| | (c) | | It is a rising/going up/ increasing trend. Increase each year It has increased/gone up It is positive | 1 | B1 Do not accept comparison of individual numbers. |
| | (d) | | This is due to rounding oe | 1 | B1 Accept any mention of rounding |
| | (e) | 10.7/44.8 (=0.2388) M1 | | 3 | M1 This may also be given if any of these figures are seen: 0.2388, 23.88, 34.1 |
| | | 1 – 'their 0.2388' OR 100 – 'their 23.88'   M1 | | | M1 |
| | | | Answers which round to  76(%)  (minus condoned) | | A1 |
| | | Alternate method +/-(10.7 – 44.8) = +/- 34.1  M1 (+/-34.1/44.8) × 100 M1 | | | SC: Answers which round to 24% gets B1 |

| 1389/1F – Section B | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| B4 (a) | | Completed bar chart | 3 | B1 for bars of heights 63% and 57% (for 2005)<br>B1 for bars of heights 70% and 65% (for 2007)<br>B1 for correct shading (for both 2005 and 2007)<br>NB allow ± 2mm tolerance in heights |
| (b) | | Two correct statements | 2 | B2 for two general or one general and one specific correct statements<br>e.g. always greater percentage of men than women/ percentages of women increasing/ big increase in percentages for both men and women in 2007/ etc<br>(B1 for only one general or one specific correct statement) |
| B5 (a) | | reason | 1 | B1 for a correct reason<br>e.g. not collected by me, from a book, from Collin's Field Guide, secondary, etc |
| (b) | | continuous | 1 | B1 for continuous |
| (c) | (4.7+6.0+4.7+5.3+9.0+2.3+1.2+3.3)/8 = 36.5/8 | 4.5625 | 2 | M1 for an attempt to add the numbers and divide by 8<br>A1 for answer in range 4.5–4.6 oe |
| (d) | | Positive correlation; the greater the length the greater the width | 2 | B1 for the greater the length the greater the width oe<br>B1 for positive (correlation) |

| 1389/1F – Section B | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| B6 (a) | | 960 | 1 | B1 for answer in range 910 – 990 |
| (b) | 600 – 400 | 200 | 1 | B1 for answer in range 190 – 200 |
| (ci) | | decreasing | 1 | B1 for decreasing/ going down/ reducing oe |
| (cii) | | Reason | 1 | B1 for a sensible reason e.g. less demand, fewer people buy houses in winter, harder to get mortgages, etc |
| (d) | | July | 1 | B1 for July (accept Jul) |
| (e) | | March and April | 1 | B1 for both March and April (accept Mar and Apr) |
| (f) | $\frac{241332}{232229}\times100$ | 103.9 | 2 | M1 for $\frac{241332}{232229}$ A1 for answer in range 103–104 |

| 1389/1F – Section B | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| B7 (a) | | Either: Men get arthritis at an earlier age than women oe<br><br>OR: Women get arthritis at a later age than men oe | 1 | B1 Note that this should be in the form of a statement not a question. |
| (b) | | Any one of:<br>It would be impossible to ask all the people who have arthritis<br>OR It would be time consuming<br>OR It would be too costly<br>OR It would produce too much data to handle | 1 | B1 |
| (c) | | All people (who have arthritis)in England | 1 | B1<br>Suggesting an age group is not acceptable since the research is for all England and arthritis occurs at all ages<br><br>Note: we need to see, or have implied, the word 'all', and 'in England' |
| (d) | | Adv: Any one from: Cheaper, Quicker, Easier, Not too much data to handle<br><br>Dis: Could be biased, not exact/accurate | 2 | B1  B1<br><br>Do not allow converse of the advantages<br>Do not allow 'wrong answers' |

| 1389/1F – Section B | | | | |
|---|---|---|---|---|
| Question | Working | Answer | Mark | Notes |
| (e) | | Any Two from:<br>Make sure surveys get relevant answers<br>OR Make sure questions are understood<br>OR To check response rates<br>OR Identifies ambiguity<br>OR Checks the methods/design work<br>OR Identifies likely responses<br>OR Allows for changes to questions<br>OR Checks how long it will take<br>OR To see what results they get | 2 | B1  B1<br><br>Do not accept:<br>To predict results<br>OR To check spelling<br>OR To check for leading questions<br>OR To check if it's fair/unbiased<br>OR To check if it's offensive |
| (f) | | This is an OPEN question<br>OR It allows for too many answers<br>OR  People will not give direct answers<br>OR People will/may not know how old they were<br>OR It is difficult to process answers. oe<br>OR No option boxes | 1 | B1<br>Do not allow they may not have arthritis. |
| (g) | | Any relevant question with correct boxes (oe) | 2 | B1 must have a question and some effort at boxes (oe) to get this mark<br><br><br>B1 for non overlapping boxes (oe) which cover the full range of answers to their question |

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