

Mark Scheme (Results)

July 2011

Functional Skills Mathematics
Level 2 (FSM02)

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July 2011
Publications Code FC028937

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Guidance for Marking Functional Mathematics Papers

General

- All candidates must receive the same treatment. You must mark the first candidate in exactly the same way as you mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- All the marks on the mark scheme are designed to be awarded. You should always award full marks if deserved, i.e. if the answer matches the mark scheme. You should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.

Applying the Mark Scheme

- The mark scheme has a column for **Process** and a column for **Evidence**. In most questions the majority of marks are awarded for the process the candidate uses to reach an answer. The evidence column shows the most likely examples you will see:
if the candidate gives different evidence for the process, you should award the mark(s).
- **Finding 'the answer'**: in written papers, the demand (question) box should always be checked as candidates often write their 'final' answer or decision there. Some questions require the candidate to give a clear statement of the answer or make a decision, in addition to working. These are always clear in the mark scheme.
- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.
- If there is a **choice of methods** shown, then marks should be awarded for the 'best' answer.
- A suspected **misread** may still gain process marks.
- It may be appropriate to **ignore subsequent work** (isw) when the candidate's additional work does not change the meaning of their answer. You are less likely to see instances of this in functional mathematics.
- You will often see correct working followed by an incorrect decision, showing that the candidate can calculate but does not understand the demand of the functional question. The mark scheme will make clear how to mark these questions.
- **Transcription** errors occur when the candidate presents a correct answer in working, and writes it incorrectly on the answer line; mark the better answer.
- **Follow through marks** must only be awarded when explicitly allowed in the mark scheme. Where the process uses the candidate's answer from a previous step, this is clearly shown. Speech marks are used to show that previously incorrect numerical work is being followed through, for example '**240**' means **their** 240.

- Marks can usually be awarded where **units** are not shown. Where units, including money, are required this will be stated explicitly. For example, 5(m) or (£)256.4 indicate that the units do not have to be stated for the mark to be awarded.
 - **Correct money notation** indicates that the answer, in money, must have correct notation to gain the mark. This means that money should be shown as £ or p, with the decimal point correct and 2 decimal places if appropriate.
 - e.g. if the question working led to $£12 \div 5$,
 - Mark as correct: £2.40 240p £2.40p
 - Mark as incorrect: £2.4 2.40p £240p 2.4 2.40 240
- Candidates may present their answers or working in many **equivalent** ways. This is denoted **o.e.** in the mark scheme. Repeated addition for multiplication and repeated subtraction for division are common alternative approaches. The mark scheme will specify the minimum required to award these marks.
- A **range** of answers is often allowed :
 - [12.5,105] is the inclusive closed interval
 - (12.5,105) is the exclusive open interval
- **Parts of questions:** because most FS questions are unstructured and open, you should be prepared to award marks for answers seen in later parts of a question, even if not explicit in the expected part.
- Discuss any queries with your Team Leader.

- **Graphs**

The mark schemes for most graph questions have this structure:

| Process | | Evidence |
|---|----|---|
| Appropriate graph or chart – (e.g. bar, stick, line graph,) | 1 | 1 of |
| | or | linear scale(s), labels, plotting (2mm tolerance) |
| | 2 | 2 of |
| | or | linear scale(s), labels, plotting (2mm tolerance) |
| | 3 | all of |
| | | linear scale(s), labels, plotting (2mm tolerance) |

The mark scheme will explain what is appropriate for the data being plotted.

A **linear scale** must be linear **in the range where data is plotted**, whether or not it is broken, whether or not 0 is shown, whether or not the scale is shown as broken. Thus a graph that is 'fit for purpose' in that the **data is displayed clearly and values can be read**, will gain credit.

The minimum requirements for **labels** will be given, but you should give credit if a title is given which makes the label obvious.

Plotting must be correct for the candidate's scale. Award the mark for plotting if you can read the values clearly, even if the scale itself is not linear.

The mark schemes for **Data Collection Sheets** refer to **input opportunities** and to **efficient input opportunities**. When a candidate gives an input opportunity, it is likely to be an empty cell in a table, it may be an instruction to 'circle your choice', or it may require writing in the data in words. These become efficient, for example, if there is a well-structured 2-way table, or the input is a tick or a tally rather than a written list.

Section A: Fitness Centre

| Question | | Process | Mark | Mark Grid | Evidence |
|-----------------------------------|--|---|------|-----------|--|
| Q1a | | Works with time | 1 or | A | Evidence of working with time e.g. 6.15 or 16.45 or 4.45 or 15 (minutes) or 45 (minutes) or 16 (hours) or counting on from 5.45pm. |
| | | States correct time | 2 | AB | 16 (hours) 45 (minutes) Incorrect notation not penalised |
| Q1b | | Chooses an appropriate graph type : line graph, scatter graph, Accept bar chart | 1 or | C | one of: linear scale, clear labels, accurate plotting (± 2 mm) of points or bars |
| | | Develops graph | 2 or | CD | two of: linear scale, clear labels, accurate plotting (± 2 mm) of points or bars |
| | | Completes graph | 3 | CDE | all of: linear scale, clear labels, accurate plotting (± 2 mm) of points or bars |
| | | Interprets graph | 1 | F | Finds the value for 5 years from their graph Interpretation must be supported by graph Interpretation of bar chart invalid |
| Total marks for question 6 | | | | | |

| | | | | | |
|---------------------------------|--|---|----------|----|---|
| Q2 | | Considers activities for one leader | 1 or | G | Timetable with at least two activities for one leader including: <ul style="list-style-type: none"> • start at 1pm |
| | | Develops time plan for one leader | 2 | GH | Timetable with five activities for one leader including: <ul style="list-style-type: none"> • start at 1pm • finish at 5.45pm • break of 15 minutes |
| | | Develops time plan for two leaders | 1 or | J | Timetable with all activities for both leaders including: <ul style="list-style-type: none"> • start at 1pm • finish at 5.45pm • break of 15 minutes |
| | | Completes time plan for two leaders | 2 | JK | Fully correct timetable with all activities for both leaders including all criteria: <ul style="list-style-type: none"> • start at 1pm • finish at 5.45pm • break of 15 minutes • not work more than 3 hours before break • work for the same total length of time |
| Total marks for question | | | 4 | | |
| Q3a | | Begins to work with average | 1 or | L | Starts to find an average for one aspect of the data set, e.g. totals number of people and divides by 6 OR orders the figures and attempts to find median OR completes a reverse check process OR calculates and totals differences |
| | | Calculates average for Aerobics | 2 | LM | Mean = 139, Median = 137, Total difference = -36 |
| | | Makes a valid decision Process mark L must be scored | 1 | N | Decision ft supported by calculations |

| | | | | | |
|---------------------------------|--|--|----------|----|---|
| Q3b | | Works with percentage | 1 or | P | Uses correct method to find 30% of any quantity e.g. $0.3 \times 156 (=46.8)$ OR $0.7 \times 156 (=109.2)$ OR $15.6 + 15.6 + 15.6$ OR $16 + 16 + 16$ |
| | | Completes calculation | 2 | PQ | 109 or 110 |
| Q3c | | Checks a calculation - any reverse calculation or estimation | 1 | R | For any calculation from 3b shows a valid check Must be a different calculation |
| Total marks for question | | | 6 | | |

Section B: Care Home

| Question | Skills standard | Process | Mark | Mark Grid | Evidence |
|---------------------------------|-----------------|---|----------|-----------|--|
| Q4a | | Finds probability | 1 | A | 3/7 Do not accept 0.43 |
| Q4b | | Makes a comparison | 1 or | B | One valid statement e.g. there is less fat or there is less carbohydrate in the beef stew or there is more salt or there is more protein in the beef stew |
| | | Makes two comparisons | 2 | BC | Two valid statements |
| Total marks for question | | | 3 | | |
| Q5a | | Converts units | 1 | D | 70 (inches) may be implied from graph |
| | | Uses graph | 1 or | E | Indication on graph of '70' inches OR indication of use of Normal band with BMI [18.5, 25] |
| | | Correct value or correct range found for Normal | 2 | EF | [127,175] ft '70' |
| Q5b | | Addresses range for snacks | 1 | G | Uses values between 450 and 500 in a calculation |
| | | Interprets criteria | 1 or | H | Chooses any three meals from any category AND totals correctly Meals can be implied from calories |
| | | Completes solution | 2 | HJ | Chooses one meal from each category AND totals correctly Meals can be implied from calories (See grid at the bottom for correct answers) |
| | | Statement demonstrates check against total calories | 1 | K | Clear statement from their calculation ft |
| Total marks for question | | | 7 | | |

| | | | | | |
|---------------------------------|--|---|----------|----|---|
| Q6 | | Converts units | 1 | L | Changes chair dimension to m OR room dimensions to mm OR changes both dimensions to cm |
| | | Starts to work with length of chairs or walls | 1 or | M | Uses chair width '0.6' OR uses wall lengths OR starts to find length for 45 chairs OR correct number of chairs along one wall on diagram e.g. $10 \div 0.6 (=16.6..)$ OR $9 \div 0.6 (=15)$ OR $8 \div 0.6 (=13.3..)$ OR $7 \div 0.6 (=11.6..)$ OR $45 \times 0.6 (=27)$ |
| | | Develops calculation with the length of chairs or walls | 2 | MN | Incorporates 4 walls in calculations OR correct number of chairs along two walls on diagram |
| | | Uses whole number of chairs to compare widths of chairs with wall lengths | 1 | P | Compares '27' (m) with '34' (m) OR compares whole number of chairs with at least 3 wall lengths e.g. 56.6 rounded to 56 or (=16, 15, 13, 11) OR compares their total chairs (=55) with 45 OR correct number of chairs along three walls on diagram |
| | | Deals with inaccessible corners | 1 | Q | Subtracts at least 1 chair or '0.6' from at least 1 length OR OR shows void on diagram OR $3 (\text{corners}) \times 0.6 (=1.8)$ |
| | | Correct solution | 1 | R | Gives diagram or clear calculations with answer e.g. 12, 11, 14 and 8 |
| Total marks for question | | | 6 | | |

Section C: Karting

| Question | Skills standard | Process | Mark | Mark Grid | Evidence |
|---------------------------------|-----------------|--|----------|-----------|--|
| Q7 | | Starts to substitute in given formula | 1 or | A | Any correct first step e.g. $380 \div 26.6 (= 14.28\dots)$ or $2.24 \div 26.6 (=0.08\dots)$ or $26.6 = 2.24 \times 380 \div T$ or $2.24 \times 380 (=851.2)$ |
| | | Rearranges formula or sets up and solves equation | 2 or | AB | $(T =) 2.24 \times 380 \div 26.6$ or $851.2 \div 26.6 (= 31.99\dots)$ OR $851.2 \div 23.7 (=35.9)$ |
| | | Calculates correct time or speed | 3 | ABC | 32 (seconds) OR 31.9... (seconds) OR 35.9 (mph) |
| | | Makes a valid comparison | 1 | D | Correctly compares times OR speeds e.g. 32 or 31.9... (seconds) AND 23.7 (seconds) OR 35.9 (mph) AND 26.6 (mph) |
| Total marks for question | | | 4 | | |
| Q8 | | Works with discount | 1 or | E | $(12-3) \times 30 (=270)$ OR $(11 - 1) \times 30 (=300)$ OR any other valid use of discount |
| | | Shares costs equally | 2 or | EF | $'270' \div 12 (=22.5)$ OR $300 \div 11 (=27.27$ or $27.28)$ |
| | | Correctly calculates cost per person | 3 | EFG | £22.50 OR £27.27 OR £27.28 correct money notation only |
| Total marks for question | | | 3 | | |
| Q9 | | Full process | 1 or | H | e.g. $250 + 90 \times 15 (=1600)$ OR $(2000 - 250) \div 90 (=19.44\dots)$ OR $(2000 - 250) - (90 \times 15) (=400)$ |
| | | Correct answer | 2 | HJ | 1600 or 19.44... or 400 |
| | | Decision based on valid working Process mark H must be scored | 1 | K | Yes or ft |

| | | | | | |
|---------------------------------|--|--|----------|----|---|
| Total marks for question | | | 3 | | |
| Q10a | | Maximises extraction rate | 1 | L | (Fan type) C |
| Q10b | | Addresses 4 air changes per hour | 1 | M | Multiplies or divides by 4 e.g. $135000 \times 4 (=540000)$ OR $60 \div 4 (=15)$ OR $2.12 \times 4 (=8.48)$ |
| | | Starts to convert time | 1 | N | Multiplies or divides by 60 |
| | | Starts the process to calculate number of fans | 1 or | P | Uses fan capacity of '17.617' from Q10a e.g. $150 \div 17.617 (=8.5\dots)$ OR $17.617 \times 60 \times 60 (=63421.2)$ |
| | | Develops calculation for number of fans | 2 | PQ | 8.5... OR ft from Q10a 17.00... (from using fan A '8.822') OR 12.9... (from using fan B '11.594') OR $135000 \div 63421.2 = 2.12\dots$ Do not penalise for omitting 4 air changes per hour |
| | | Completes calculation for whole number of fans | 1 | R | Whole number of fans (=9) ft from their value |
| Total marks for question | | | 6 | | |

5b) Correct Answers within range 1475 to 1525

| Breakfast | Dinner | Supper | Total for 3 meals | Correct Total + Snacks |
|----------------------|--------------------|-----------------------|--------------------------|-------------------------------|
| Porridge 180 | Shepherd's Pie 580 | Soup & Bread Roll 220 | 980 | {1475,1480} |
| Sausage & Tomato 220 | Shepherd's Pie 580 | Soup & Bread Roll 220 | 1020 | {1475,1520} |
| Sausage & Tomato 220 | Shepherd's Pie 580 | Sandwiches 200 | 1000 | {1475,1500} |
| Sausage & Tomato 220 | Shepherd's Pie 580 | Beans on Toast 190 | 990 | {1475,1490} |
| Eggs & Bacon 230 | Shepherd's Pie 580 | Soup & Bread Roll 220 | 1030 | {1480,1525} |
| Eggs & Bacon 230 | Shepherd's Pie 580 | Sandwiches 200 | 1010 | {1475,1510} |
| Eggs & Bacon 230 | Shepherd's Pie 580 | Beans on Toast 190 | 1000 | {1475,1500} |

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Order Code FC028937 July 2011

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