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# Mark Scheme (Results)

November 2014

## Pearson Edexcel Functional Skills Mathematics Level 2 (FSM02)

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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- If working is **crossed out and still legible**, then it should be marked, as long as it has not been replaced by alternative work.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÷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 or | 1 of linear scale(s), labels, plotting (2 mm tolerance) |
| | 2 or | 2 of linear scale(s), labels, plotting (2 mm tolerance) |
| | 3 | all of linear scale(s), labels, plotting (2 mm 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: General maintenance**

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q1** | R1 | Begin to work with paint or coverage | 1or | A | 450 ÷ 15(=30)(litres) **OR**<br>7×5(=35)(litres) **OR**<br>450 ÷ 7(= 64.2…) **OR**<br>5 × 15(=75) |
| | A4 | Full process to find figures to compare | 2 | AB | '35' ×15(=525)($m^2$) **OR**<br>75× 7 (=525)($m^2$) **OR**<br>450 ÷ 15(=30)(litres) **and** 7×5(=35)(litres) **OR**<br>'30' ÷ 5 (=6)(tins) **OR**<br>450 ÷ 7(= 64.2)($m^2$) **and** 5 × 15(=75)($m^2$) |
| | I6 | Correct conclusion with accurate figures | 1 | C | YES **and** 525($m^2$) **OR**<br>YES **and** 30 **and** 35(litres) **OR**<br>YES **and** 6 (tins) or 1 left over oe **OR**<br>YES **and** 64.2($m^2$) **and** 75($m^2$) |
| **Total marks for question** | | | **3** | | |

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q2a** | R2 | Process that starts to substitute at least one term into the equation | 1or | D | 3.14×2.5 (= 7.85) **OR**<br>$2.5^2$ (=6.25) **OR**<br>3.14×1.2 (=3.768) **OR**<br>2.5×1.2 (=3) |
| | A4 | Complete substitution process | 2 or | DE | 3.14 × $2.5^2$ × 1.2 (=23.55) |
| | I6 | Correct answer from correct working. Correct units | 3 | DEF | 23.55 $m^3$<br>Correct units |
| **Q2b** | A4 | Begins to process perimeter by finding an unspecified length or Uses a suitable conversion | 1 or | G | 4 + 6(=10) **or** 8 − 5(=3) **or**<br>1800mm converted to 1.8 m<br>May be seen in subsequent working |
| | R2 | Finds correct perimeter | 2 | GH | 8+ 4+3+ 6+ 5+10=36 |
| | I6 | Starts process to find number of edgings or process to compare prices | 1 or | J | e.g. '36'÷'1.8'(=20) **OR** '36'÷2 (=18) **OR**<br>Complete process to find number of edgings from counting **OR**<br>6.99÷'1.8'(=3.88...) **OR** 9.99÷'2'(=4.995) oe<br>Their 36 must come from an addition of lengths, not from a multiplication of lengths (an area process). |
| | R3 | Complete process to find number of edgings or process to compare prices | 2 | JK | e.g. '36'÷'1.8'(=20) **and** '36'÷2 (=18) **OR**<br>Complete process to find number of edgings from counting **OR**<br>6.99÷'1.8'(=3.88...) **and** 9.99÷'2'(=4.995) oe<br>Allow addition of at least 4 appropriate lengths for '36' for marks J and K only |
| | A4 | Complete process to find cost of edgings | 1 or | JKL | '20'×6.99(=139.8(0)) **and '**18'×9.99(=179.82) **OR**<br>'36'×'3.88'(=[139.6(0), 140.4(0)]) |

| | | | | | |
|---|---|---|---|---|---|
| | I7 | Correct costs and correct decision | 2 | JKLM | Hardings **AND** (£)[139.6(0), 140.4(0)] **and (**£**)[**179.82, 180] **OR**<br>Hardings **AND** (£)[139.6(0), 140.4(0)] **and (**£**)**4.99 or (£)5 |
| **Total marks for question** | | | **9** | | |

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q3** | R1 | Process to find cost for 1 person without using a meal deal **or** process to find to find cost for 1 person using an appropriate meal deal. | 1 or | N | Ashraf : 3.8(0) + 1.7(0) + 0.9(0)+2×0.85(=8.1(0)) **OR**<br>Denny: 2.8(0) + 1.1(0) + 1.3(0) + 0.85(=6.05) **OR**<br>Meal deal B for Ashraf: 5.5(0) + 0.9(0) + 0.85(=7.25)<br>**OR**<br>Meal deal for Denny: 3.5(0) + 1.1(0)(=4.60) |
| | A4 | Correct cost for 1 person using a meal deal. | 2 | NP | Meal deal A for Ashraf: 7.25 **OR**<br>Meal deal B for Denny: 4.60<br>May be subsumed in subsequent working |
| | A5 | Full process to find cost for 2 persons by coordinating deal A and B | 1 or | Q | 3.50 + 5.50 +0.9(0) + 1.1(0) + 0.85(= 11.85) **OR**<br>e.g. 13 – (3.50 + 5.50 +0.9(0) + 1.1(0) + 0.85)(= 1.15) **OR**<br>e.g. 3.50 + 1.10 +3.80 + 1.70 + 0.90 + 2 × 0.85(=12.7) **OR**<br>'7.25' + '4.6'(=11.85) |
| | I6 | Correct figure and correct decision | 2 | QR | YES **and** (£)11.85 **OR**<br>YES **and** (£)12.7(0) (Denny deal + Ashraf no deal) **OR**<br>YES **and** (£)1.15 (change) **OR**<br>YES **and** (£)0.3(0) (change)<br>If this mark is awarded, award mark NP. |
| **Total marks for question** | | | **4** | | |

**Section B: Holiday to Trinidad**

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q4** | R3 | Process to use months or process to use percentage | 1 or | A | e.g. 9×1431(=12879) **OR**<br>0.23×1431(=329.13) **OR**<br>2500 ÷ 9(=[277.77, 277.78])<br>Any build up process must be complete and correct |
| | A4 | Process to use months and process to use percentage | 2 or | AB | e.g. 9×1431×0.23(=2962.17) **OR**<br>2500÷9(=[277.77, 277.78]) **and** 1431×0.23(=329.13) |
| | I6 | Correct decision with correct figures | 3 | ABC | Yes **and** (£)2962.17 **OR**<br>Yes **and** (£)277.78 **or** (£)329.13 |
| | A5 | Shows a suitable check | 1 | D | Check using reverse calculation, alternate method or estimation |
| **Total marks for question** | | | **4** | | |

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q5a** | R3 | Process to find discounted price or convert TT$ to £ | 1 or | E | 1200×0.8(=960) or 1200÷5(=240) **OR**<br>1200÷9.3(=129.03...) |
| | I6 | Finds discounted price or process to find discount | 2 or | EF | 960(TT$) **OR**<br>**'**129.03...'×0.8(=103.225...) **or** '129.03...'÷5(=25.8...) |
| | A4 | Process to find suitable figures to compare | 3 or | EFG | 89.99×9.3(=[836,837]) **OR**<br>'960'÷ 9.3([103,104]) |
| | I6 | Correct decision from accurate figures | 4 | EFGH | (TT$)[836,837] **and** 960 **and** e.g. buy (the perfume) in UK OR<br>(£) [103,104] **and** e.g. buy (the perfume) in UK oe |
| **Q5b** | R1 | Process of summation for at least 4 visit times or travel times, or counts back at least 4 times | 1 or | J | e.g.<br>30(m) +15(m) + 60(m) +45(m) + 2(h) + 1(h) + 4(h)(=9<br>**OR**<br>1800, 1730, 1715, 1615 ... oe |
| | A4 | Complete process to find departure time | 2 or | JK | e.g.<br>6 pm – '9h 30 m' (= 0830) oe **OR**<br>9.5(h) |
| | I6 | Finds correct time | 3 | JKL | 0830 oe |
| **Total marks for question** | | | **7** | | |

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q6** | R1 | Process for dilution or process for papaya | 1 or | M | 200 × 2(=400) **OR**<br>1 papaya makes 800(ml)(juice) **OR**<br>8 ÷ ¼(=32) (batches can be made) |
| | A4 | Process for dilution and process for papaya | 2 | MN | 200 × 2(=400) **and** 1 papaya makes 1600(ml)(punch) **OR**<br>200 × 2(=400) **and** 8 ÷ ¼(=32) |
| | R2 | Process to find quantity of diluted juice required or available | 1 | P | 40 × 500(=20 000)(ml) **OR**<br>'32'× 200 × 2(=12800) |
| | R1 | Process to find number of papayas required or available diluted juice per person. | 1 | Q | '20000' ÷ '1600'(= 12.5) **OR**<br>12800 ÷ 40(=320) **OR**<br>**'**20000' ÷ '400' (=50) (batches) needed **OR**<br>12800 ÷ 500 (=25.6) (people) |
| | I6 | Makes correct decision | 2 | R | No **and** 12.5 or 13(papaya) **OR**<br>No **and** 12800 **and** 20000 (ml) **OR**<br>**No and** 12800 ÷ 40(=320) **OR**<br>No **and** 32 (batches) **and** 50 (batches) **OR**<br>No **and** 25.6 or 25 or 26 (people) |
| **Total marks for question** | | | **5** | | |

**Section C: Farming**

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q7a** | A4 | Uses consistent units | 1 | A | E.g. '5400' ÷ 10000(=0.54) **OR**<br>10000 ÷ 2(=5000)<br>NB may be seen in subsequent working |
| | R1 | Process to find area of plot | 1 or | B | 60 × 90(=5400) ($m^2$) **OR**<br>10000 ÷ 2500(=4) space permitted per chicken ($m^2$) **OR**<br>2500 ÷ 10000(=0.25) chickens per square metre allowed **OR**<br>1200 ÷ 2500(=0.48) hectares allowance for the 1200 chickens |
| | A4 | Full process to find figures to compare | 2 or | BC | E.g. '0.54' × 2500(=1350) **OR**<br>1200 ÷ 2500 × 10000(=4800) ($m^2$) **and** 60 × 90(=5400) ($m^2$) **OR**<br>'5400' ÷ '4'(=1350) **OR**<br>'0.25' × 5400(=1350) **OR**<br>'5400' ÷ 10000(=0.54) **and** 1200 ÷ 2500(=0.48) **OR**<br>10000 ÷ 2500 (=4) **and** 5400 ÷ 1200 (=4.5) |
| | I6 | Correct figures and correct conclusion | 3 | BCD | Yes **AND** 1350 (chickens) **OR**<br>Yes **AND** 4800 ($m^2$) **and** 5400 ($m^2$) **OR**<br>Yes **AND** 0.54 **and** 0.48 (hectares) **OR**<br>Yes **AND** 4 **and** 4.5 ($m^2$ per chicken)<br>NB If Mark D is awarded, award Mark A. |
| **Q7b** | R2 | Works with 1 dimension or process to find both volumes | 1 or | E | E.g. 650 ÷ 300(=2) **OR** 300 + 300(=600) **OR** 70 + 70 (=140) **OR**<br>300×100×70(=210000) and<br>650×160×460(=47840000) |
| | A4 | Complete process to work | 2 or | EF | 2 (boxes) × 4 (boxes) × 2 (boxes) (=16) **OR** |

| | | | | | |
|---|---|---|---|---|---|
| | | with 3 dimensions or process to find number of boxes by considering volumes | | | 6 (boxes) × 1 (boxes) × 2 (boxes) (=12) **OR** (650 × 460 × 160) ÷ (300 × 100 × 70)(=22.78...) |
| | I7 | Correct figure | 3 | EFG | 16 (boxes) accept clearly drawn diagrammatic solutions<br>Note – there is another solution with 12 boxes and 4 boxes sideways |

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q7c** | A5 | Starts to plan route | 1 or | H | Shows a route **or** a correct distance:<br>E.g. BHLNJ or reverse **OR** 59 (miles) **OR**<br>JNLHB or reverse OR 59( miles) OR<br>BJNLH or reverse **OR** 61 (miles) **OR**<br>HBJNL or reverse **OR** 63 (miles) **OR**<br>HBLNJ or reverse **OR** 63 (miles) **OR**<br><br>Shows a complete inefficient route **and** its distance. |
| | I6 | Complete correct solution | 2 | HJ | JNLHB or reverse OR 59( miles) **OR**<br>BHLNJ or reverse **and** 59 (miles) **OR**<br>BJNLH or reverse **and** 61 (miles) **OR**<br>HBJNL or reverse **and** 63 (miles) **OR**<br>HBLNJ or reverse |
| **Total marks for question** | | | **9** | | |

| Question | Skills Standard | Process | Mark | Mark Grid | Evidence |
|---|---|---|---|---|---|
| **Q8a** | R3 | Complete process for median | 1 | K | 8, 9, 9.5, 15, 16, 17, 17.5,18 **and** (15 + 16) ÷ 2(=15.5) |
| | R2 | Complete process for mean | 1 | L | 8 + 9.5 + 16 + 17.5 + 18 + 17 + 15 + 9 (=110) **and** 110 ÷ 8(=13.75) |
| | A4 | Correct figure for one average | 1 or | M | 13.75 **OR** 15.5 |
| | I7 | Decision and correct figures for both averages | 2 | MN | Median **AND** 13.75 **and** 15.5 |
| **Q8b** | R1 | Begins to design record sheet | 1 or | P | Headings for at least 2 of: 4 cows, two milking per day, 5 days, with input opportunities or record sheet for 1 cow |
| | I6 | Improves record sheet | 2 or | PQ | Headings for all of: 4 cows, two milking per day, 5 days, with input opportunities **OR** complete record sheet for 1 cow **OR** complete record sheet for 1 day |
| | I6 | Fit for purpose record sheet | 3 | PQR | Efficient input opportunities across the three features. |
| **Total marks for question** | | | **7** | | |



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