gateway qualifications

# Functional Skills

# Maths – Level 2

# Sample

## Mark Scheme and Marking Guidance

The following documents are included in this marking guidance:

- General marking guidance and assessment principles.
- Mark schemes and guidance.

**Assessment Code: FSML2AA/P**

**General Marking Guidance**

- 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.

**Allowable responses**

All of the following are Allowable types of responses.

- Writing initials of objects
- Drawings or symbols
- Drawing lines to show position or matches
- Evidence of counting
- Marking in any way to indicate choices.

**Applying the Mark Scheme**

- The mark scheme states the marks awarded for the process and the answer. In most questions the majority of marks are awarded for the process the candidate uses to reach an answer. The most likely processes used by candidates are given. However, if the candidate gives different evidence for a correct process you should award the mark(s).
- If working is crossed out and still legible, then it should be marked, as long as it has not been replaced by alternative work.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 the candidate shows more than one set of working, then you should mark the one you consider to be closest to the mark scheme.
- If it appears that the candidate has misread the question, marks can still be awarded for applying the correct process.
- 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.
- Where transcription errors occur and the candidate presents a correct answer in working, but writes it incorrectly on the answer line, mark the better answer.
- **Error carried forward** marks (**ecf**) 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.
- 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 (£) 256.40 indicates that the units do not have to be stated for the mark to be awarded.

- **Correct money notation** (**cmn**) 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 as '**oe'** – 'or equivalent'. 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.
- **Parts of questions**: because most Functional Skills questions are unstructured and open, you should be prepared to award marks for answers that are not in their expected position e.g. an answer expected in a later part of a question may be given earlier in the candidate's response.

**Using the mark scheme**

- apply the mark scheme methodically
- most mark points are single. However, where required:
    - initially apply the unshaded section for each question
    - if this is not achieved, then work down the shaded rows until you find the right mark
    - if none of the shaded sections are met then award 0 for that part of the mark scheme.

| Section A - Recycling | | | |
|---|---|---|---|
| **Question** | **Answer** | **Marks** | **Skills** |
| 1 | Interprets that the material with the greatest proportion is:<br>paper<br>**AND**<br>because it is the bigg**est** / larg**est** /great**est** section **or** percentage<br><br>Allow: oe but must use superlative or describe superlative, i.e. bigger than the others<br>Do not allow: bigg**er** / larg**er** / great**er** section or percentage | 1 | I |
| **2** | Represents the calculation to find 19% of 5.8 (million tonnes)<br>19/100 x 5.8 (million tonnes)<br>**OR**<br>0.19 x 5.8 (million tonnes)<br><br>Allow: oe | 1 | R |
| | Interprets that on rounding to 2 dps the answer is:<br>1.10 (million tonnes) | 1 | I |
| **3** | Represents the calculation to find probability:<br>10/10 – 9/10 **OR** 1 – 9/10 **OR** 1 – 0.9 **OR** 100% - 90%<br><br>Allow: oe | 1 | R |
| | Calculates the probability as:<br>1/10 **OR** 0.1 **OR** a tenth **OR** one in ten **OR** 10%<br><br>Allow: oe | 1 | A |
| **4** | Represents the use of the question/answer from **Q3**:<br>1/10 of recycled glass bottles are **not used** (to make new bottles or containers)<br>**OR**<br>only 90% or 9/10 of recycled glass bottles are used (to make new bottles or containers)<br><br>Allow: oe<br>Allow: ecf from miscalculated answer to **Q3** | 1 | R |
| | Interprets that:<br>only relevant for those recycled bottles that are used (to make new bottles or containers) | 1 | I |
| | Calculates energy saving:<br><br>100(%) – 68(%) = 32% | 1 | A |
| | Interprets that:<br>36% energy saving is incorrect | 1 | I |

| | | | |
|---|---|---|---|
| **5** | Represents the calculation to find the money from recycling:<br>(155(kg)/1 000(kg)) x (£)22<br><br>Allow: oe | 1 | R |
| | Calculates the money from recycling:<br>£3.41<br><br>cmn | 1 | A |
| **6(a)** | Complete valid check of any original calculation seen in **Q5** using a different method to the one shown:<br>e.g. a reverse calculation **OR** a calculation using estimated / approximate values | 1 | A |
| **6(b)** | Explains why check was effective, for example:<br>My estimation is close to the answer I found therefore effective<br>**OR**<br>Check is above the original answer which is as I expected because I rounded up<br>**OR**<br>I reversed the calculation by dividing my answer by (£)22 and multiplying by 1 000(kg). This gave me the 155(kg) of bottles.<br><br>Allow: oe | 1 | I |
| | | | **Total for Section A = 13 marks** |

| Section B - Holiday! | | | |
|---|---|---|---|
| **Question** | **Answer** | **Marks** | **Skills** |
| **1** | Calculates Spain Direct and interprets the need to take doubling for the return into account:<br>(3 **x 2**)((£)140) + 6((£)6.50) + 6((£)12) = £951<br><br>cmn<br>Allow: oe | 2 | A, I |
| | Calculates Spain Direct without doubling values to take 'one way' into account:<br>3 x ((£)140) + 6((£)6.50) + 6((£)12) = £531 | (1) | (A) |
| | Calculates Fast Go:<br>3((£)231) + 3((£)14.50) + 3((£)20) = £796.50<br>cmn | 1 | A |
| | Calculates England UK:<br>3((£)328) + 3((£)15) + 3((£)16) = £1 077 | 1 | A |
| | Calculates Pink:<br>3((£)281) + 3((£)15.50) + 3((£)17.50) = £942 | 1 | A |
| | (Allow **one** mark if Fast Go, England UK and Pink are all correctly calculated without using a **£** in the final answers **OR** have not multiplied by 3 people, e.g. Fast Go £265.50 **AND** England UK £359 **AND** Pink £314) | (1) | (A) |
| | Interprets that they should use:<br>Fast Go (as it is the cheapest) | 1 | I |

| | | | |
|---|---|---|---|
| **2** | Calculates maximum spend on hotel:<br>2/5 x (£)700 = £280<br><br>Allow: oe | 1 | A |
| | Interprets that:<br>Sunset, Palm Trees and Beach Front can be discounted (as are over £280)<br>**OR**<br>keeps Blue Sea and Finest (as are under £280)<br><br>Allow: from only continuing with calculations for Blue Sea and Finest **OR** from notes/crossing out in table (where relevant) | 1 | I |
| | Represents the calculation to find taxi fares in €s:<br>i.e. divides distance by 3 and multiplies by 2<br>Blue Sea: 69(km) / 3 x (€)2 (= €46) **AND**<br>Finest: 102(km) / 3 x (€)2 (= €68)<br><br>Allow: oe | 1 | R |
| | Represents the calculation to find the taxi fares in £s:<br>i.e. by dividing €s by 1.4:<br>Blue Sea: (€)46 / 1.4 **AND**<br>Finest: (€)68 / 1.4<br><br>Allow: ecf from miscalculations of taxi fares in €s<br>Allow: oe | 1 | R |
| | Interprets the need to round the taxi fares to the nearest penny:<br>Blue Sea: £32.857142 rounded to £32.86<br>Finest: £48.571428 rounded to £48.57<br><br>£s must be used for this mark<br>cmn<br>Allow: ecf from miscalculations of taxi fares in €s<br>Allow: taxi fares from 3dp for rounding<br>Allow: from values used in calculations of total costs | 1 | I |
| | Calculates the total cost of hotel and taxi fares and interprets that the hotel costs are for three people:<br>Blue Sea: **3 x** (£)274 + (£)32.86 = £854.86<br>Finest: **3 x** (£)250 + (£)48.57 = £798.57<br><br>cmn<br>Allow: ecf from miscalculations of taxi fares in £s | 2 | A, I |
| | Calculates the total cost of hotel and taxi fares:<br>Blue Sea: (£)274 + (£)32.86 = £306.86<br>Finest: (£)250 + (£)48.57 = £298.57<br><br>cmn<br>Allow: ecf from miscalculations of taxi fares in £s | (1) | (A) |
| | Interprets that:<br>Finest (hotel is the cheapest hotel and taxi fare) | 1 | I |
| | | | **Total for Section B = 14 marks** |

| Section C – Charity | | | |
|---|---|---|---|
| **Question** | **Answer** | **Marks** | **Skills** |
| **1** | Represents the calculation to find 12% of his wages:<br>12/100 x (£)84<br>**OR**<br>0.12 x (£)84<br><br>Allow: oe | 1 | R |
| | Calculates 12% of his wages:<br>£10.08<br>cmn<br>Allow: oe | 1 | A |
| | Interprets that he has two options of either<br>**two** lots of clean water/£5 **OR one** lot of medical supplies/£10 | 2 | I |
| | Interprets that he has only one option:<br>t**wo** lots of clean water/£5 **OR** one lot of medical supplies/£10<br>**OR** states that he could choose any **one** of the options | (1) | (I) |
| **2** | Represents the calculation to find 89% of £30:<br>89/100 x (£)30<br>**OR**<br>0.89 x (£)30<br><br>Allow: oe | 1 | R |
| | Calculates 89% of £30:<br>£26.70<br>cmn | 1 | A |

| | | | |
|---|---|---|---|
| **3** | Calculates area of field:<br>42.5(m) x 32.8(m) = 1 394($m^2$) | 1 | A |
| | Represents the calculation to find the proportion of 85 (gallons):<br>1 394($m^2$) / 1 000($m^2$)<br>**OR**<br>Represents the calculation to find gallons per $m^2$:<br>85 (gallons)/1 000($m^2$)<br><br>Allow: ecf from miscalculation of area of field<br>Allow: oe | 1 | R |
| | Represents the calculation to find the number of gallons:<br>1.394($m^2$) x 85 (gallons)<br>**OR**<br>0.085 (gallons per $m^2$) x 1 394($m^2$)<br><br>Allow: ecf from miscalculation of area of field<br>Allow: oe | 1 | R |
| | Calculates the number of gallons:<br>118.49(gallons) | 1 | A |
| | Calculates number of litres by converting gallons to litres:<br>118.49(gallons) x 4.55 (= 539.1295)<br><br>Allow: ecf from miscalculation of number of gallons | 1 | A |
| | Interprets that:<br>to nearest whole litre **rounds down** to 539 (litres)<br><br>Allow: ecf from miscalculation of number of litres rounded correctly | 1 | I |
| **4** | Converts cm to m at any point, e.g. 76cm = 0.76m<br><br>Allow: from values used in calculation | 1 | R |
| | Represents equation by inputting all values:<br>e.g. v = 22/7 x 0.38 x 0.38 x 2.2<br><br>Allow: π = 3.14 or 3.1428 or 3.143 | 2 | R |
| | Represents equation with one error:<br>e.g. uses diameter instead of radius | (1) | (R) |
| | Calculates volume:<br>0.998 ($m^3$) | 1 | A |
| | Interprets volume to nearest $m^3$:<br>1 ($m^3$)<br><br>Allow: ecf from miscalculated volume only if rounded to nearest $m^3$ | 1 | I |

| | | | |
|---|---|---|---|
| **5** | Represents the calculation required by:<br>discounting the 0.8m on the side measuring 12.8m<br>36(m) x 12(m) | 1 | R |
| | Calculates area:<br>432 ($m^2$)<br><br>Allow: area calculated as (36(m) x 12.8(m)) = 460.80 ($m^2$) | 1 | A |
| | Represents calculation by:<br>each seedling taking up an area of 4$m^2$ **OR** divides calculated area by 4($m^2$) | 1 | R |
| | Calculates number of seedlings as:<br>108 (seedlings) | 1 | A |
| **6(a)** | A complete correct check of any original calculation seen in **Q5** using a different method<br>e.g. a diagram showing correct seedling planting **OR** reverse calculation **OR** a calculation using approximate values | 1 | A |
| **6(b)** | Explains why check was effective, for example:<br>My estimation is close to the answer I found therefore effective<br>**OR**<br>Check is above the original answer which is as I expected because I rounded up<br>**OR**<br>I reversed the calculation and found that my answer multiplied by 4 gave me the area of the field (without the 0.8m)<br><br>Allow: oe | 1 | I |
| | | | **Total = 23 marks** |

## Item Breakdown Grid Level 2

| **Section A – Recycling** | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Question** | **Skills standards** | **Coverage and Range** | | | | | | | | | | | |
| | | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** | **l** |
| **1** | I | | | | | | | | | | | | |
| **2** | R, I | | | | | | | | | | | | |
| **3** | R, A | | | | | | | | | | | | |
| **4** | R, A, I | | | | | | | | | | | | |
| **5** | R, A | | | | | | | | | | | | |
| **6(a)** | A | | | | | | | | | | | | |
| **6(b)** | I | | | | | | | | | | | | |
| **Section B – Holiday** | | | | | | | | | | | | | |
| **Question** | **Skills standards** | **Coverage and Range** | | | | | | | | | | | |
| | | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** | **l** |
| **1** | A, I | | | | | | | | | | | | |
| **2** | R, A, I | | | | | | | | | | | | |
| **Section C – Charity** | | | | | | | | | | | | | |
| **Question** | **Skills standards** | **Coverage and Range** | | | | | | | | | | | |
| | | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** | **l** |
| **1** | R, A, I | | | | | | | | | | | | |
| **2** | R, A | | | | | | | | | | | | |
| **3** | R, A, I | | | | | | | | | | | | |
| **4** | R, A, I | | | | | | | | | | | | |
| **5** | R, A | | | | | | | | | | | | |
| **6(a)** | A | | | | | | | | | | | | |
| **6(b)** | I | | | | | | | | | | | | |

## Functional Skills Criteria for Mathematics – Ofqual – Level 2

| Skills standards | Coverage and range | Assessment weighting |
|---|---|---|
| Representing<br>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.<br><br>2. Identify the situation or problems and identify the mathematical methods needed to solve them.<br><br>3. Choose from a range of mathematics to find solutions. | a) Understand and use positive and negative numbers of any size in practical contexts;<br><br>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;<br><br>c) Understand, use and calculate ratio and proportion, including problems involving scale;<br><br>d) Understand and use equivalences between fractions, decimals and percentages;<br><br>e) Understand and use simple formulae and equations involving one- or two-step operations;<br><br>f) Recognise and use 2D representations of 3D objects;<br><br>g) Find area, perimeter and volume of common shapes;<br><br>h) Use, convert and calculate using metric and, where appropriate, imperial measures;<br><br>i) Collect and represent discrete and continuous data, using ICT where appropriate;<br><br>j) Use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate;<br><br>k) Use statistical methods to investigate situations;<br><br>l) Use probability to assess the likelihood of an outcome. | 30-40% |
| Analysing<br>4. Apply a range of mathematics to find solutions.<br><br>5. Use appropriate checking procedures and evaluate their effectiveness at each stage. | | 30-40% |
| Interpreting<br>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.<br><br>7. Draw conclusions and provide mathematical justifications. | | 30-40% |

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