

# Maths – Level 2

## Mark Scheme and Marking Guidance

### Sample Assessment

The following documents are included in this marking guidance:

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

**Assessment Code: FSML2AD/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- If working is crossed out and still legible, then it should be marked, as long as it has not been replaced by alternative work.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  $£12 \div 5$ ,  
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 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.

Task 1 – Mini Golf Course			
Item	Answer	Marks	Skills
1a	Interpretation that Kim is wrong because the area of turf needed is <b>more than</b> 30m <sup>2</sup> Allow: ecf from miscalculation of area of green	1	I
	Addition of combined areas 14.7 + 19.8 = 34.5(m <sup>2</sup> ) Allow: ecf from miscalculation of combined areas <b>OR</b> Subtraction of 'missing area' from regular rectangular space 46.75 – 12.25 = 34.5(m <sup>2</sup> ) Allow: ecf from miscalculation of 'missing area'	1	A
	Representation of two calculations multiplying length by width dimensions of each section e.g. 4.9 x 3 (= 14.7(m <sup>2</sup> )) 5.5 x 3.6 (= 19.8(m <sup>2</sup> )) <b>OR</b> 8.5 x 5.5 (= 46.75(m <sup>2</sup> )) 4.9 x 2.5 (= 12.25(m <sup>2</sup> ))	1	R
	Represent a calculation to find a missing dimension required to calculate area e.g. 8.5(m) – 4.9(m) <b>OR</b> 5.5(m) – 3.0(m)	1	R
1b	Interpretation that the length of edging required is more than 25m Allow: "No" if based on correct application of formula Allow: ecf based on incorrect application of formula	1	I
	Calculation using formula: (3.14 x 8.4) = 26.38m (to 2 dp) Allow for using value of $\pi$ as 3.142 or 22/7 = 26.39 (to 2 dp) or 26.4 respectively	1	A
	Diameter and $\pi$ inserted in formula	1	R

1c	All points plotted correctly with accurate line of best fit drawn Allow: tolerance of +/- 1 small square Do <b>not</b> allow: for a bar chart	3	R
	All points plotted correctly but no line of best fit drawn Allow: tolerance of +/- 1 small square Do <b>not</b> allow: for a bar chart <b>OR</b> At least 6 points plotted correctly with accurate line of best fit drawn Allow: tolerance of +/- 1 small square Do <b>not</b> allow: for a bar chart	(2)	
	Line of best fit drawn but inaccurately represented (e.g. too great a distance between line and points above/below line) Do <b>not</b> allow: for a bar chart	(1)	
	Scale selected and applied accurately (for at least 6 points) e.g. 1 big square = 10 minutes Allow: for a bar chart	1	R
	Graph labelled correctly: e.g. x axis = Size of group y axis = Time taken to complete round (minutes) Allow: for a bar chart	1	R
1d	Between 62 minutes and 66 minutes. Allow: ecf based on line of best fit Allow: ecf based on values not accurately represented on graph	1	I
Total marks for Task 1 = 13			

Task 2 – The Cycle Challenge			
Item	Answer	Marks	Skills
2a	Day 2 – 38 or 38.4 (miles) AND Day 3 – 58 or 57.6 (miles)	1	I
	Representation of percentage calculations: Day 3 60% of 96 as $60/100 \times 96$ Day 2 40% of 96 as $40/100 \times 96$ Allow oe for percentage calculations Allow: percentage calculation replaced with a subtraction of Day 3 from 100% Allow ecf from miscalculated remaining distance	1	R
	Calculation of remainder of mileage $160 - 64 = 96$ (miles) Allow ecf from miscalculation of 2/5ths of total distance	1	A
	Representation of calculation of a distance for Day 1 that is 2/5ths of the total distance e.g. $(160 \div 5) \times 2 (= 64 \text{ (miles)})$ Allow: oe for calculating 2/5ths	1	R
2b	Interpretation: Kurt's bike is not a suitable frame (size) for him Allow: Kurt's bike frame is too small	1	I
	Rounding conversion figure to nearest inch = 33 inches <b>OR 33"</b> Allow: rounding down to nearest inch = 32 inches <b>OR 32"</b> Using table to find frame size which matches inside leg measurement of 33 inches = 58cm Allow: using table to find frame size which matches inside measurement of 32 inches = 56cm Allow: ecf from miscalculated conversion	1	I
	Conversion of inside leg measurements to inches by applying conversion $83 \div 2.54 = 32.677$ (inches) Allow $83 \div 2.54 = 32.68$ (inches) Allow $83 \div 2.54 = 32.7$ (inches)	1	A

2c	Interpretation of calculations of quantities of water, orange juice and salt: $800 \times 1.5 = 1\ 200$ ml of water $200 \times 1.5 = 300$ ml of orange juice $\frac{1}{2} \times 1.5 = \frac{3}{4}$ tablespoon salt	1	I
	Identify ratio between quantity of water and orange juice and apply this ratio to 1 500ml <b>OR</b> 1.5l of drink Allow: oe - identify ratio between fluid of recipe and volume of Kurt's bottles as 1:1.5 and apply this to multiply water and orange by 1.5	1	I
	Conversion of litres to ml or vice versa and applying this to calculate the total amount of drink Kurt can make $2 \times 0.75$ (litres) = 1.5 (litres) <b>OR</b> $2 \times 750$ (ml) = 1 500(ml)	1	A
2d	Interpretation that Kurt's fluid would last for 72 minutes	1	I
	Represent multiplication of 4.8 by 15 minutes to calculate time taken to drink 1.5L $4.8 \times 15$ Allow: ecf from miscalculation of number of drinks in bottles per 15mins	1	R
	Calculate number of drinks available in bottles per 15 minutes $1\ 500 \div 312.5 = 4.8$ Allow: ecf from quantity of drink per 15 mins	1	A
	Interpretation that quantity of drink per 15 minutes at 22.5°C is $250 + 62.5 = 312.5$ (ml) Allow: ecf from miscalculation of percentage of drink	1	I
	Calculate 25% of quantity of drink per 15 minutes when temperature is more than 15°C $25\%$ of 250 = 62.5(ml) Allow: oe for calculating percentage Allow: ecf from miscalculation of percentage of drink	1	A
	Calculate % increase based on temperature difference $7.5 \div 3 = 2.5$ $2.5 \times 10 = 25\%$ Allow: ecf from miscalculation of temperature difference	1	A
	Representation of calculation to find difference between actual temperature and 15°C $22.5 - 15 (= 7.5(^{\circ}\text{C}))$	1	R
2ei	Complete valid check of any calculation seen in 2(a) using a <b>different method</b> to the one shown	1	A

	e.g. a reverse calculation or one that uses approximation		
2eii	Explains why check was effective e.g. All days' total mileage added up to 160 miles OR I calculated $\frac{3}{5}$ of mileage total because it is equivalent to 60%	1	1
<b>Total marks for Task 2 = 19</b>			

Task 3 – A trip to the Lake District			
Item	Answer	Marks	Skills
3a	Interpretation that Stables is the cheapest holiday cottage Allow: ecf from miscalculation of any cottage's total costs for 7 nights	1	I
	Calculation for 7 nights at Thatched cottage (£)390 + (4 x (£)95) = £770	1	A
	Representation of cost for 7 nights at Homely as £825	1	R
	Calculation for 7 nights at Stables cottage (£)188 + (6 x (£)188/2) = £752	1	A
	Calculation for 7 nights at Rose cottage (£)520 + (3 x (£)97.50) = £812.50 Cmn Allow: ecf from miscalculation of 1 night at Rose cottage	1	A
	Show calculation to work out discount for Rose Cottage at 25% $25/100 \times (£)520/4$ Allow: oe for calculating percentage <b>OR</b> Show calculation to work out 75% of Rose cottage for 1 night $75/100 \times (£)520/4$ Allow: oe for calculating percentage	1	R
3b	Interpretation that Sam is wrong because this would not give them enough time. Allow: correct interpretation based on ecf of total time taken	1	I
	Addition of total time taken $2 \text{ hrs } 40 \text{ mins} + 2 \text{ hrs} + 45 \text{ mins} = 5 \text{ hours and } 25 \text{ minutes}$ Allow ecf based on miscalculation of travel time on roads and/or motorways	1	A
	Calculation of time taken on other roads $80 \div 40 = 2 \text{ (hours)}$	1	R
	Interpretation that it will take 2 hours and 40(.2 OR 12 seconds)minutes on the motorways	1	I
	Calculation of time taken to travel on motorways $160 \div 60 = 2.67 \text{ (hours)}$	1	A

3c	Interpretation that Ellie is correct because subtraction of 5°C from 4.5(°C) = - 0.5°C Allow ecf from miscalculation of temperature drop	1	I
	Calculation of temperature drop for height climbed $715.3/1\ 000 \times 7^{\circ}\text{C} = 5.(0071)^{\circ}\text{C}$	2	A
	Calculation of temperature drop for height climbed $715.3 \div 142.857(14) = 5.(007105)$ or $5.(0071001)^{\circ}\text{C}$ Allow: $715.3 \div 142.9 = 5.(0055983)$ or correctly rounded answer Allow: $715.3 \div 142.86 = 5.(0069998)$ or correctly rounded answer Allow ecf from miscalculation of height in metres per drop of 1°C	(1)	(A)
	Calculation of height in metres per drop of 1°C $1\ 000 \div 7 = 142.857(14)$ (metres/°C) Allow: rounding to 142.86 or 142.9 (metres/°C)	(1)	(A)
	Interpretation of difference in height between Skiddaw peak and holiday cottage $915.3$ (metres) – $200$ (metres) = $715.3$ metres Allow ecf from miscalculation of height of Skiddaw in metres	1	I
	Calculation of height of Skiddaw in metres by applying conversion $\frac{3\ 051 \times 30}{100} = 915.3$ (metres)	1	A
3di	Complete valid check of any calculation seen in 3(c) using a <b>different method</b> to the one shown e.g. a reverse calculation or one that uses approximation	1	A
3dii	Explains why check was effective e.g. When I reversed the calculation I ended up with Skiddaw being 3 051 feet high OR I rounded up the answers to all my calculations and ended up with a change of 5°C	1	I
Total marks for Task 3 = <b>18</b>			
Total marks for Task 1, 2, and 3 = <b>50</b>			

## **Skills reference**

A – Analysing

I – Interpreting

R - Representing

## Item Breakdown

Task 1 – Mini Golf Course			
Item	Skills Standard	Coverage and Range	Marks
1a	<p>Representing</p> <p>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.</p> <p>2. Identify the situation or problems and identify the mathematical methods needed to solve them.</p> <p>3. Choose from a range of mathematics to find solutions.</p> <p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts;</p> <p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>f) Recognise and use 2D representations of 3D objects;</p> <p>g) Find area, perimeter and volume of common shapes;</p> <p>h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	4
1b	<p>Representing</p> <p>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.</p> <p>2. Identify the situation or problems and identify the mathematical methods needed to solve them.</p> <p>3. Choose from a range of mathematics to find solutions.</p> <p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts;</p> <p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>e) Understand and use simple formulae and equations involving one- or two-step operations;</p> <p>f) Recognise and use 2D representations of 3D objects;</p> <p>g) Find area, perimeter and volume of common shapes;</p> <p>h) Use, convert and calculate using metric and, where</p>	3

	7. Draw conclusions and provide mathematical justifications.	appropriate, imperial measures;	
1c	<p>Representing</p> <p>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.</p> <p>2. Identify the situation or problems and identify the mathematical methods needed to solve them.</p> <p>3. Choose from a range of mathematics to find solutions.</p>	<p>i) Collect and represent discrete and continuous data, using ICT where appropriate;</p> <p>h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	5
1d	<p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>j) Use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate;</p>	1

<b>Task 2 – The Cycle Challenge</b>			
Item	Skills Standard	Coverage and Range	Marks
2a	<p>Representing</p> <p>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.</p> <p>2. Identify the situation or problems and identify the mathematical methods needed to solve them.</p> <p>3. Choose from a range of mathematics to find solutions.</p> <p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts;</p> <p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>d) Understand and use equivalences between fractions, decimals and percentages;</p> <p>h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	4
2b	<p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p> <p>j) Use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate;</p>	3
2c	<p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar</p>	<p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>c) Understand, use and calculate ratio and proportion,</p>	3

	<p>and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>including problems involving scale;</p> <p>d) Understand and use equivalences between fractions, decimals and percentages;</p> <p>h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	
2d	<p>Representing</p> <p>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.</p> <p>2. Identify the situation or problems and identify the mathematical methods needed to solve them.</p> <p>3. Choose from a range of mathematics to find solutions.</p> <p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts;</p> <p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>c) Understand, use and calculate ratio and proportion, including problems involving scale;</p> <p>d) Understand and use equivalences between fractions, decimals and percentages;</p> <p>h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	7
2e	<p>Analysing</p> <p>5. Use appropriate checking procedures and evaluate their effectiveness at each stage.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts;</p> <p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>d) Understand and use equivalences between fractions, decimals and percentages;</p> <p>h) Use, convert and calculate using metric and, where</p>	2

		appropriate, imperial measures;	
3a	<p>Representing</p> <p>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.</p> <p>2. Identify the situation or problems and identify the mathematical methods needed to solve them.</p> <p>3. Choose from a range of mathematics to find solutions.</p> <p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts;</p> <p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>d) Understand and use equivalences between fractions, decimals and percentages;</p> <p>j) Use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate;</p>	6
3b	<p>Representing</p> <p>1. Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.</p> <p>2. Identify the situation or problems and identify the mathematical methods needed to solve them.</p> <p>3. Choose from a range of mathematics to find solutions.</p> <p>Analysing</p> <p>4. Apply a range of mathematics to find solutions.</p> <p>Interpreting</p> <p>6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts;</p> <p>b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places;</p> <p>h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	5

3c	<p>Analysing 4. Apply a range of mathematics to find solutions.</p> <p>Interpreting 6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts; b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places; h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	5
3d	<p>Analysing 4. Apply a range of mathematics to find solutions.</p> <p>Interpreting 6. Interpret and communicate solutions to multi-stage practical problems in familiar and unfamiliar contexts and situations.</p> <p>7. Draw conclusions and provide mathematical justifications.</p>	<p>a) Understand and use positive and negative numbers of any size in practical contexts; b) Carry out calculations with numbers of any size in practical contexts, to a given number of decimal places; h) Use, convert and calculate using metric and, where appropriate, imperial measures;</p>	2