

Functional Skills Mathematics

Level 2 sample assessment

Marking scheme
PAPER-BASED

These materials relate to the assessments
that will be in use from September 2015



Sample Paper 1

Level 2 Sample Paper 1

	Mark	Represent	Analyse	Interpret	Open	Fixed
1A	3	3	0	0	3	0
1B	13	6	7	0	13	0
1C	4	0	0	4	4	0
1D	2	0	0	2	2	0
1E	3	0	0	3	3	0
2A	4	2	2	0	1	3
2B	10	1	1	8	10	0
2C	2	1	1	0	2	0
2D	9	4	3	2	9	0
3A	4	2	1	1	0	4
3B	4	1	2	1	1	3
3C	2	1	1	0	2	0
3D	5	1	3	1	5	0
3E	3	1	2	0	0	3
3F	4	0	0	4	4	0
3G	3	0	0	3	3	0
	75	23	23	29	62	13
		31%	31%	39%	83%	17%

Guidance notes for Sample Paper Mark Schemes Level 1 and Level 2

Notes:

The mark scheme has been carefully constructed to avoid penalising candidates repeatedly for similar errors:

1) Principle of follow through applies throughout unless otherwise stated. This allows the candidates to gain credit for subsequent correct calculation based on a previous incorrect answer.

2) Units or numbers shown in brackets on the mark scheme are not required for the awarding of mark/s on the candidate's paper. However, if a candidate states units they must be correct:

eg 24(cm) means accept 24cm or 24 but not 24m

eg (£)72.5(0) means accept £72.50 or £72.5 or 72.50 or 72.5

3) URT means unrounded, rounded or truncated; the underlining defines the acceptable limit of approximation:

eg 860. 8652 URT (U is the unrounded version)

the following are acceptable: 860 (T) or 861 (R) 860.8 (T) or 860.9 (R) or 860.86 (T) or 860.87 (R) or 860.865 (R) or 860.8652 (U) but not eg 900.

Total marks available: 75

Notional pass mark: 50 (or above)

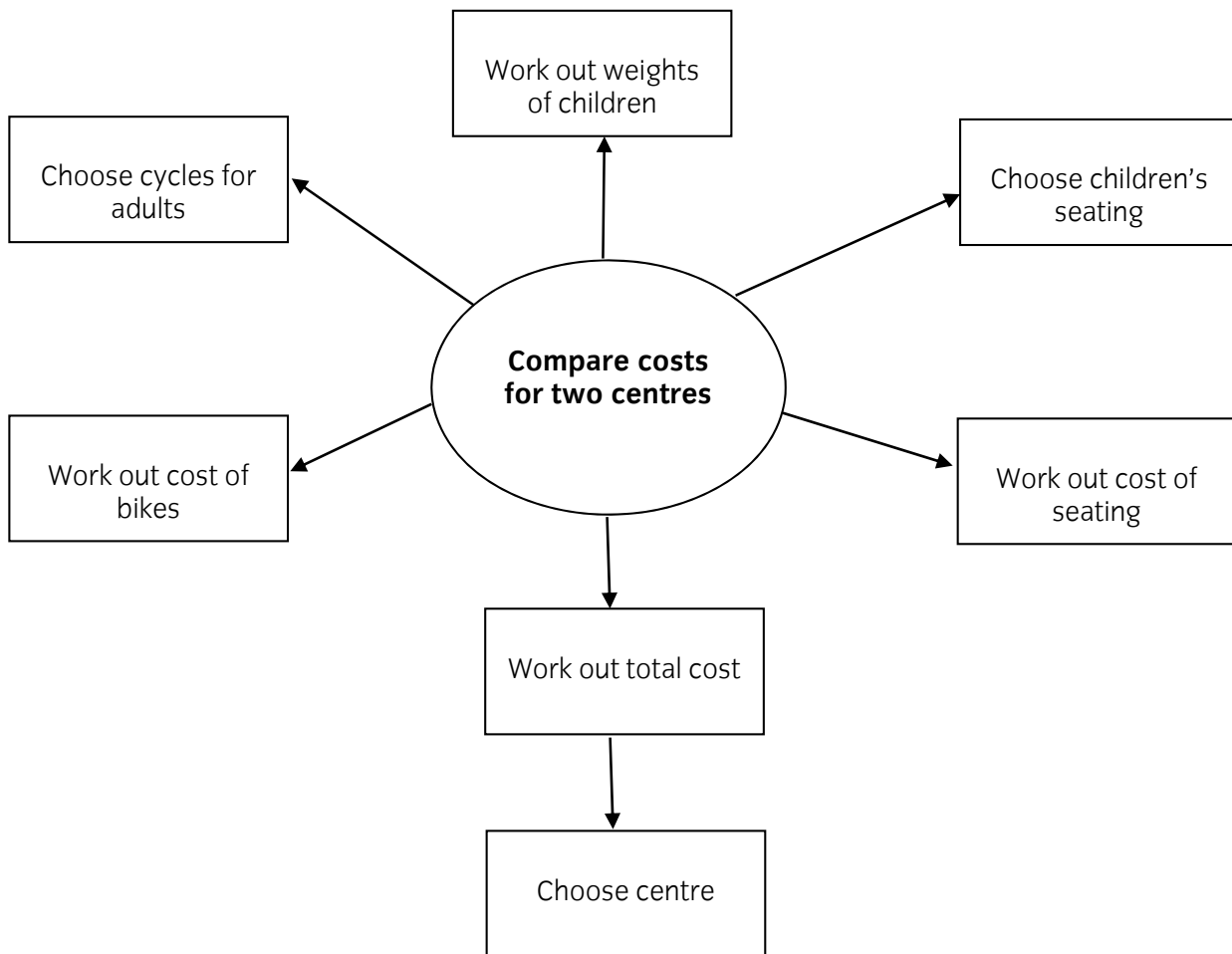
NB incorrect money format given as an answer should only be penalised **once** on the whole paper and will lose 1 mark, eg Task 1B Bert's Bike (£)122.5 loses one mark. Do not penalise any subsequent incorrect format.

Maths Level 2: Task 1 – Cycle hire

Step	Total marks	Marks	Marks awarded for
Task 1 Step A	3	1	evidence of systematic/methodical plan indicated in sequence eg sequential list or simple flow chart or spidergram/mindmap or ordered text or combination of suitable types.
		2	content to include reference to at least THREE of: <ul style="list-style-type: none"> • weight(s) of children • choice of children's seating • choice of cycles for adults • (total) costs • two hire centres
		1	reference to at least TWO of the above
Task 1 Step B	13		<i>weights of children</i>
		3	19(kg) for 3½ year-old AND 11(kg) for 18 month-old accept 19.1(kg) or 19.09(kg) AND 11.4(kg) or 11.36(kg)
		2	19. <u>09090909</u> (kg) URT or 11. <u>36363636</u> (kg) URT or complete correct method for one conversion with one calculation error
		1	÷ 2.2 seen (for conversion of pounds to kg) or 42 seen (for conversion of pounds to stones)
			<i>suitable child seating</i>
		2	suitable seating chosen compatible with calculated weight eg 1 trailer seats both children (combined weight 30kg) under 35(kg) OR 1 child seat for child less than 18(kg) AND 1 trailer for less than 35(kg)
		1	1 child seat for child less than 18(kg) or 1 trailer for less than 35(kg)
			<i>cost of child seating</i>
		2	two costs consistent with chosen seating eg Bert's Bikes (£)122.50 AND Go Bike (£)99(.00) for trailer only OR eg Bert's Bikes (£)122.50 AND Go Bike (£)99(.00) for trailer and child seat
		1	one centre cost eg Bert's Bikes (£)122.50 or Go Bike (£)99(.00) for trailer only or eg Bert's Bikes (£)122.50 or Go Bike (£)99(.00) for trailer and child seat
			<i>suitable adult cycles</i>
		1	4 adult cycles OR 2 adult cycles and a tandem
			<i>cost of adult cycles</i>
		2	correct total costs for their chosen cycles for both centres eg (£)406 (Bert's Bikes) AND (£)180 (Go Bike) for 4 adult cycles OR (£)360.50 (Bert's Bikes) AND (£)265 (Go Bike) for 2 adult cycles and tandem
		1	correct total costs for their chosen cycles for one centre
			<i>total cost</i>
		1	correct total costs seen for both centres
	<i>check</i>		
2 no marks for repeat calc	a complete correct check of any original calculation seen using a different method eg a reverse calculation OR a calculation using approximate values		
1	a correct check, which is not finished		
Task 1 Step C	4	1	table structure showing both centres with rows and columns and appropriate delineation
		1	headings / labels for at least three of ie name of centre or equipment or cost of cycles or cost of child seating or total cost or cost difference

		1	their data entered for equipment to hire and cycle costs and child seating costs	
		1	their total costs for both centres in the table with units indicated	
Task 1 Step D	2	1	choice of centre with one suitable reason eg Go Bike is cheaper OR Go Bike has special deals OR Go Bike has a weekly rate OR Bert's Bikes are better as they are more expensive	
		1	choice of equipment with one suitable reason eg I can fit the trailer on the bike OR I can carry two children in the trailer OR four adult cycles are cheapest	
Task 1 Step E	3	3	three comments relevant to one or more review prompts ie plan and methods or sensible answers or difficulties or other information or tackling a similar problem	
			some acceptable comments	some unacceptable comments
		eg My plan helped me structure my work to find costs of bicycle hire. eg The method I used to convert the weights took a long time. eg Results are sensible because prices are similar for the two centres. eg I found it difficult that some of the information was in pounds and stones and some was in kilograms. eg It would be useful to know how far away each centre was. eg I would choose cheaper bikes. eg I would convert kilograms to stones eg I would make a more ordered plan so that I knew what to do.	eg My plan worked well. (ie unqualified) eg My methods worked well. (ie unqualified) eg My answers seemed sensible. (ie unqualified) eg I found 1B difficult. (ie unqualified) eg There was not enough space in 1D to write my answers. (inappropriate) eg I had all the information I needed. (ie unqualified) eg I would choose different bikes. (ie unqualified) eg I would do nothing differently. (ie unqualified)	
		2	two comments	
		1	one comment	
Total for task 1 = 25 marks				

Example spidergram/mindmap for 1A



Example sequential list for 1A

- Work out weights of children
- Choose children's seating
- Choose which bikes
- Work out cost of seating for Bert's Bikes
- Work out the cost of the bikes for Bert's Bikes
- Add cost of seating and cost of bikes for Bert's Bikes
- Repeat for Go Bike
- Compare costs
- Choose centre

Example tables for 1E (candidates may construct other suitable tables)

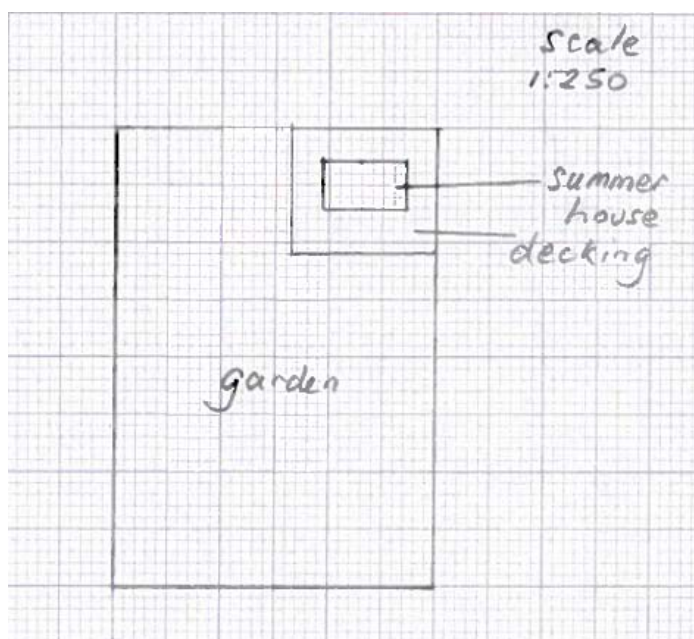
	A	B
Cycle hire (4 bikes)	406.00	180.00
Child seating (trailer)	122.50	99.00
Total £	528.50	279.00

	Cycle hire (tandem + 2 bikes)	Seats (trailer)	Total
Bert's Bikes	£360.50	£122.50	£483
Go Bike	£265	£99	£364

Maths Level 2: Task 2 – Summerhouse			
Step	Total marks	Marks	Marks awarded for
Task 2 Step A	4	4	5.9m AND 6.6m WITH UNITS OR 5900mm AND 6600mm WITH UNITS
		3	5.9 AND 6.6 or 5900 AND 6600
		2	5.9(m) or 6.6(m) or 5900(mm) or 6600(mm)
		1	value for conversion of one dimension eg 2.4(m) or 3.6(m) or 1500(mm) or 2000(mm) or 3000(mm) or 3500(mm) or complete correct method for one dimension with one calculation error
Task 2 Step B	10	1	suitable scale chosen eg 1:200
		1	scale labelled or indicated clearly eg 1:200 accept 1cm represents 2m or arrow drawn to represent 2m or equivalent
		2	outline of garden drawn to scale $\pm \frac{1}{2}$ small square
		1	one set of parallel sides drawn for outline to scale $\pm \frac{1}{2}$ small square
		2	outline of decking drawn to scale $\pm \frac{1}{2}$ small square in top right hand quarter of the garden follow through 2A
		1	outline of decking drawn to scale ± 1 small square anywhere in the garden
		3	outline of summerhouse drawn to scale $\pm \frac{1}{2}$ small square AND correctly positioned on decking ie facing south AND distances from edges as on sketch
		2	outline of summerhouse drawn to scale $\pm \frac{1}{2}$ small square AND positioned in either orientation on decking with distances from edges as on sketch
		1	outline of summerhouse drawn to scale ± 1 small square anywhere on their decking
Task 2 Step C	2	2	a correct explanation of one of the lines in 2B using their scale eg for scale 1:200 15m \div 200 = 7.5cm or 1 square = 2m so 10 squares = 20m 1cm = 2m AND 7.5cm = 15m
		1	a partial check eg for scale 1:200 1cm = 2m or 10cm = 20m or 1 square = 2m or 7.5 squares = 15m
Task 2 Step D	9	<i>calculation of area for grass</i>	
		3	261.06(m²) accept 261(m²) or 260(m²) OR accept 258(m²) or 259(m²) (from counting squares on scale diagram and applying scale) follow through 2A
		2	correct area for two rectangles that form part of the solution ie 300(m ²) and 38.94(m ²) or 211.5(m ²) and 49.56(m ²) or 168(m ²) and 93.06(m ²) or correct area for three rectangles that form part of the solution ie 49.56(m ²) and 93.06(m ²) and 118.44(m ²) or complete correct method with one calculation error or number of squares from scale diagram x4 (for 1:200 scale)
		1	correct area for any one rectangle that forms part of the solution or correct count of number of squares from their diagram
		<i>identifying packs to buy</i>	
2	value between 11.7(kg) and 13.1(kg) (weight of grass seed using formula) follow through from their value for area	value(s) between 50 and 55.6(m ²) for coverage of 2.5kg packet AND value(s) between 10 and 11.2(m ²) for coverage of 500g packet AND value(s) between 5 and 5.6(m ²) for coverage of 250g packet	

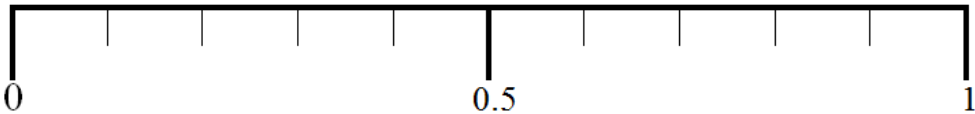
	1	correct substitution into formula (using their value for area and a value between 45 and 50 for r)	value(s) between 50 and 55.6(m ²) for coverage of 2.5kg packet or value(s) between 10 and 11.2(m ²) for coverage of 500g packet or value(s) between 5 and 5.6(m ²) for coverage of 250g packet
	4	correct combination of packs to provide the <u>cheapest</u> solution for sufficient seed from their formula or from their pack coverage calculation AND corresponding total cost eg £88.45 for 5@2.5kg + 1@500g + 1@250g (for 13.1kg required) OR £74.95 for 5@2.5kg (for 11.7kg)	
	3	correct combination of packs to provide a solution for sufficient seed from their formula or from their pack coverage calculation but solution is not the cheapest AND corresponding total cost eg £89.94 for 6@2.5kg (for 13.1kg required)	
	2	correct combination of packs to provide the <u>cheapest</u> solution for sufficient seed from their formula or from their pack coverage calculation or corresponding total cost eg £88.45 for 5@2.5kg + 1@500g + 1@250g (for 13.1kg required) or £74.95 for 5@2.5kg (for 11.7kg)	
	1	correct combination of packs to provide a solution for sufficient seed from their formula or from their pack coverage calculation but a solution which is not the cheapest or corresponding total cost eg £89.94 for 6@2.5kg (for 13.1kg required)	
			Total for task 2 = 25 marks

2B example scale diagram



Scale	1:200	1:250
Garden length (20m)	10cm	8cm
Garden width (15m)	7.5cm	6cm
Decking length (5.9m)	2.95cm	2.36cm
Decking width (6.6m)	3.3cm	2.64cm
Summerhouse (3.6m)	1.8cm	1.44cm
Summerhouse (2.4m)	1.2cm	0.96cm
Position on decking (2m)	1cm	0.8cm
Position on decking (1.5m)	0.75cm	0.6cm

Maths Level 2: Task 3 – Hotel review

Step	Total marks	Marks	Marks awarded for												
Task 3 Step A	4 do not accept pie chart	2	0.05 OR 5% OR 1/20 OR 1 in 20 chance OR 1 out of 20 do not allow 1:20												
		1	20												
		2	probability scale showing either 0-1 or 0-100% or 'impossible' / 'certain' as end points AND showing/labelling their probability eg approximately midway between 0 and 0.1 for probability = 0.05 Example of a probability scale Probability of winning (0.05) 												
		1	probability scale showing either 0-1 or 0-100% or 'impossible' / 'certain' as end points or line drawn without extremes indicated eg without 0 and 1 but with their probability shown approximately to scale along the line												
Task 3 Step B	4	3	all ranges correct 4 AND 4 AND 4												
		2	one range correct												
		1	maximum and minimum identified for one range ie 5 AND 1												
		1	suitable explanation eg 'The customer's views varied (a lot).'												
Task 3 Step C	2 no marks for repeat calc	2	a complete correct check of any original calculation seen in Task 3B using a different method eg a reverse calculation												
		1	a correct check, which is not finished												
Task 3 Step D	5	4	choice of average AND 2 corresponding values for Service AND Staff <table border="1" data-bbox="491 1509 1268 1803"> <thead> <tr> <th></th> <th>Mean</th> <th>Mode</th> <th>Median</th> </tr> </thead> <tbody> <tr> <td>Service</td> <td>3.6</td> <td>4</td> <td>4</td> </tr> <tr> <td>Staff</td> <td>3.4</td> <td>3</td> <td>3</td> </tr> </tbody> </table>		Mean	Mode	Median	Service	3.6	4	4	Staff	3.4	3	3
			Mean	Mode	Median										
		Service	3.6	4	4										
		Staff	3.4	3	3										
		3	one correct average corresponding to their choice or 2 consistent correct averages if no choice indicated or does not match choice												
2	complete correct method and value for one average if no choice indicated or does not match choice eg $72 \div 20 = 3.6$ for median incorrectly stated														
1	correct method for calculating a mean or correct method for calculating a median eg attempt to order data to find middle or $(n+1) / 2^{\text{th}}$ place seen or correct method for finding mode														

			eg evidence of numbers collected or counted by frequency for mode
		1	suitable explanation eg mean; includes all the review data/information eg median; avoids outliers or extreme review values eg mode; only five categories, enough modal values to be reliable
Task 3 Step E	3	3	60(%)
		2	0.6×100 or $\frac{12}{20} \times 100$ or $\frac{6}{10} \times 100$ or $\frac{3}{5} \times 100$ or $\frac{60}{100} \times 100$ or $\times 100 \div 20$ or equivalent seen
		1	0.6 or $\frac{12}{20}$ or $\frac{6}{10}$ or $\frac{3}{5}$ or $\frac{60}{100}$ or $\times 100$ seen or $\div 20$ seen or evidence of recognition of 4 and 5 as Good and Very Good eg 4s and 5s circled
Task 3 Step F	4	1	valid downward trend line drawn for Blues Hotel with approximately equal plots either side of the trend line
		1	valid upward trend line drawn for Giltspur Hotel with approximately equal plots either side of the trend line
		1	one valid comment about the Blues Hotel eg 'The average rating is falling (for the Blues Hotel).' eg 'The Blues Hotel is getting worse.' accept reference to negative correlation
		1	one valid comment about the Giltspur Hotel eg 'The average rating is rising (for the Giltspur Hotel).' eg 'The Giltspur Hotel is getting better.' accept reference to positive correlation
Task 3 Step G	3	3	decision with three valid supporting comments comparing two results from each hotel eg Yes, because <ul style="list-style-type: none"> the Giltspur Hotel staff rating is higher than the Blues Hotel the Giltspur Hotel cleanliness rating are higher than the Blues Hotel the Giltspur Hotel overall customer satisfaction is higher (increasing) or because Blues Hotel is lower (decreasing) note generic statements such as 'The results are worse' are not acceptable
		2	decision with two valid supporting comments comparing two results from each hotel or no decision indicated but three correct comments
		1	decision with one valid supporting comments comparing two results from each hotel or no decision indicated but two correct comments
			Total for task 3 = 25 marks

3F example trendlines



Level 2 SAMPLE PAPER 1

Coverage and Range (Technical Skills)	Task 1	Task 2	Task 3
C2.1 Understand and use positive and negative numbers of any size in practical contexts	✓	✓	✓
C2.2 carry out calculations with numbers of any size in practical contexts, to a given number of decimal places	✓	✓	✓
C2.3 Understand, use and calculate ratio and proportion, including problems involving scale		✓	
C2.4 Understand and use equivalences between fractions, decimals and percentages		✓	✓
C2.5 Understand and use simple formulae and equations involving one- or two-step operations		✓	
C2.6 recognise and use 2D representations of 3D objects		✓	
C2.7 find area, perimeter and volume of common shapes		✓	
C2.8 use, convert and calculate using metric and, where appropriate, imperial measures	✓	✓	
C2.9 collect and represent discrete and continuous data, using ICT where appropriate		✓	✓
C2.10 use and interpret statistical measures, tables and diagrams, for discrete and continuous data, using ICT where appropriate		✓	✓
C2.11 use statistical methods to investigate situations	✓	✓	✓
C2.12 use probability to assess the likelihood of an outcome			✓