

# OXFORD CAMBRIDGE AND RSA EXAMINATIONS LEVEL 2 FUNCTIONAL SKILLS MATHEMATICS

09866

### **TASK AND ANSWER BOOKLET PRACTICE PAPER 3**

**TIME: 1 HOUR 30 MINUTES** 

INSTRUCTIONS																	
Fill in all the boxes below. Make s <b>LETTERS</b> .	sure y	our	pers	sona	l de	tails	are	ente	ered	cor	rectly	y. L	Jse	BL	оск		
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<ul><li>a calculator</li><li>a ruler</li></ul>										-			-	ΤΔς	K B	/	/20
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YOU HAVE 1 HOUR AND 30	MINU	JTE	ST	O C	ON	IPLI	ETE	TH	E							/	
THREE TASKS										L						/	
For each task, make sure that you	u:									L						/	/20
<ul> <li>read the questions carefully before starting</li> </ul>						-			-	TASK C							
write your answers in this booklet							H						/				
clearly show how your working leads to your answers									/								
2 marks are available in each task when you show you have																	
checked your work.											/	/20					
When you have finished, hand this booklet and all the							0										
Resource Documents to the supe																	

Ofqual Qualification Reference Number: 500/8910/9

### **RESOURCE DOCUMENTS**

The Resource Documents on pages 5, 7, 9, 11, 13 and 15 contain information to help you to answer the tasks in this booklet.

- The resource documents are perforated along the left hand side, so they can be removed from the task and answer booklet.
- Your supervisor will instruct you when to remove the resource documents, before you start the assessment.
- Please fold pages 5, 7, 9, 11, 13 and 15 along the perforated strip before removing from the task and answer booklet.

### TASK A - MAKING LUNCH

### **RESOURCE DOCUMENT 1**

Here is the menu from the sandwich shop. Each sandwich is made from 2 slices of bread.

# **Meal Deal**

### Any sandwich, crisps and drink only £2.99

Any sandwich, crisps and drink only £2.99					
Sandwiches	Fat content Per sandwich				
Tuna salad Ham, cheese and pickle Chicken salad Egg mayo Cheese and tomato Ham and egg salad Bacon	13.5 g 18.9 g 17.1 g 17.5 g 17.6 g 16.5 g 23.5 g				
Crisps	Fat content Per packet				
Ready salted Cheese and onion Salt and vinegar	11.4 g 11.4 g 11.4 g				
Drinks	Fat content				
Still water Sparkling water	none none				

### Guideline daily amounts for average adults

Each day	Women	Men
Calories	2000 kcal	2500 kcal
Fat	70 g	95 g
Saturates	20 g	30 g
Salt	6 g	6 g
Sugar	90 g	120 g

### TASK A - MAKING LUNCH

Omar finds this information from a supermarket website.

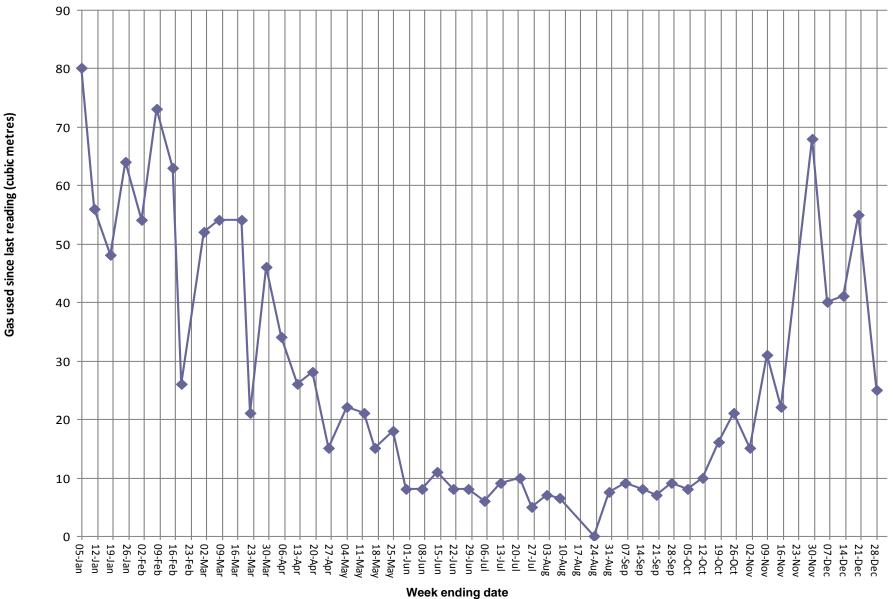
Nutritional information								
Item	Amount	Energy	Protein	Fat	Carbohydrate			
Thick sliced white loaf	In one slice	105 kcal	3.6g	0.7g	21.0g			
Low fat cheese slices	In one slice	70 kcal	8.2g	4.0 g	trace			
Salad tomatoes	In one tomato	13kcal	0.5 g	0.2g	2.2g			
Salt and vinegar crisps	In one packet	135 kcal	1.4g	8.3 g	13.0g			

Item	Weight	Cost
Thick sliced white loaf	800 g	£0.74
Low fat cheese slices	10 × 25 g	£1.95
Salad tomatoes	6 pack	£0.88
Salt and vinegar crisps	6 × 25 g	£0.87
Still water	500 ml	£0.43

An average loaf of bread contains 18 slices.

TASK B – USING GAS RESOURCE DOCUMENT 1

Here is the graph showing Alex's weekly gas usage for 2009.



### TASK B - USING GAS

Here are the numbers of kilowatt hours (kWh) Alex used in each quarter of 2009.

Quarter	1	2	3	4
Gas used (kWh)	6326	1493	1301	6898

Note: a quarter of a year is 3 months.

### Alex's gas charges

Price excluding VAT					
First 1143 kWh per quarter	Remaining kWh				
3.500 p per kWh	2.549p per kWh				

Price including VAT (at 5%)					
First 1143 kWh per quarter	Remaining kWh				
3.675 p per kWh	2.676p per kWh				

## Fed up with your high winter fuel bills?

Choose our special tariff and spread your payments over the whole year.

Saver tariff All prices include VAT

First 2680 kWh per year 5.41485 p per kWh Each remaining kWh 2.62080 p per kWh

6% discount for online billing

### **TASK C - TRAMPOLINE**

### **RESOURCE DOCUMENT 1**

Carla finds this information about trampolines.

### Superior trampoline

Lifetime guarantee against rust

Diameter: 360 cm Maximum weight 114 kg

£365 including delivery



Anchor kit

£15

Needed with all trampolines

Delivered free with any trampoline

Carla's local council gives her this information.

### Safety surface guidelines for outdoor play equipment

- Safety surfaces must extend at least 180 cm around all sides of the base of equipment.
- Where bark is used, this should be at least 300 mm deep.
- It is important to have additional bark available to top up to the original level.

Carla finds these formulas in her diary.

### Circumference of a circle

 $C = \pi d$  or  $C = 2\pi r$ 

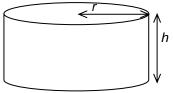
Area of a circle

 $A = \pi r^2$ 



Volume of a cylinder

$$V = \pi r^2 h$$



Volume of a sphere

$$V = \frac{4}{3} \pi r^3$$



Volume of a cone

$$V = \frac{1}{3} \pi r^2 h$$



Take  $\pi$  = 3.1 or use the value on your calculator

### **TASK C - TRAMPOLINE**

Carla found this information from a garden supplies company on the internet.

### Log roll fence

For straight or curved edges
Available in 5 heights
Guaranteed for 12 years against rot
Free delivery over £39.99



Height	150 mm	230 mm	300 mm	375 mm	450 mm
Length	1.8 m				
Price (inc VAT)	£5.99	£6.99	£8.99	£10.99	£12.99

### Play Bark Safety Surface

Play bark certificated to BS EN 1177: 1998

Safety certificated, fire certificated

Safe depth – at least 300 mm

Price includes VAT and delivery to UK mainland

1 cubic metre bulk bag £139.00 2 cubic metre bulk bag £189.00



### **TASK AND ANSWER PAGES**

Do not turn over this page until you are told to do so by your supervisor.

### TASK A - MAKING LUNCH

### You will need Task A Resource Document 1

Omar works in an office from Monday to Friday each week. He goes out to a sandwich shop each day to buy his lunch. Each day Omar buys the Meal Deal.

Q1	(a)	(i)	How much does he spend at the sandwich shop each week?	
				(2 marks)
		(ii)	Omar has 4 weeks holiday from work each year.	(= ::::::::::)
		(,	How much does he spend at the sandwich shop in a year?	
				(2 marks)

Omar is worried that he is eating too much fat. His favourite sandwich is cheese and tomato.

# Your Meal Deal gives you over a quarter of the daily guideline amount of fat.

b)	Is Ken correct?	
	Use calculations to justify your answer.	
		(2 monto)
		(3 marks)

Omar thinks his lunch might have less fat if he made it himself. He finds some information from a supermarket website.

He uses low fat cheese to make a cheese and tomato sandwich. He also takes a bag of crisps and a bottle of water.



(c)	Is Ken correct?									
	Explain how you get your answer.									
		(4 marks								

(7 marks)
(7 marks)
(7 marks)
(7 marks) Checking (2 marks)

**END OF TASK A** 

### TASK B - USING GAS

### You will need Task B Resource Document 1

Alex uses gas in his home for heating, cooking and hot water. He draws a graph showing the amount of gas he used each week in 2009.

Q2	(a)	(i)	When Alex went on holiday, no gas was used in his home. When was this?
		(ii)	Alex did not use his heating in the summer. In which month do you think he turned it back on again?
			(1 mark)
		(iii)	During which month was the outside temperature probably the coldest? Give a reason for your answer.
			(2 marks)
			(Z iliaiks)

Alex is sent a gas bill every three months (one quarter of a year). Gas suppliers charge by the number of kilowatt hours (kWh) used each quarter.

(i)	Show that Alex will pay about £42, including VAT, for the first 1143 units of gas he uses in each quarter.
	(2 marks
(ii)	Find the total amount, including VAT, that Alex pays for gas for all four quarters of 2009.
	(4 mark
	can pay a fixed amount each month for the whole year instead of paying a quarter.
His ( Alex	gas supplier says he should pay £45 each month for the next year. thinks that this is not a good deal. correct?
	ain your answer.
	(2 marks

Alex thinks that he might be able to save money by changing to a different gas supplier.

He finds details on the internet of a Saver tariff and wants online billing.

		Exam use o
		(Q:
(6	marks)	
		Exam
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Checking (2	marks)	
Checking (2	marks)	
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**END OF TASK B** 

### TASK C - TRAMPOLINE

### You will need Task C Resource Document 1

Carla is a childminder.	
She wants to put a trampoline in her garden.	

13	(a)	How much does it cost Carla for the Superior trampoline and an anche	or kit?
			(2 marks)
		a will make a circular safety area under and around the trampoline. must follow the safety surface guidelines.	
	(b)	What is the smallest diameter the safety area can be?	
			(2 marks)
		is a scale drawing of Carla's garden. safety area will be more than 1 metre away from the house and any fer	nce.
	(c)	Shade the region where <b>no part</b> of the safety area can be placed.	
		fence	
	1		
9	asnon		fence
		fence	

Scale: 1 cm to 2 m

(2 marks)

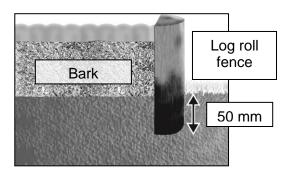
Carla will put a low fence around the outside of the circular safety area.

She will use log roll fencing for this.

She will use *Play Bark* for the safety area surface.

The height of the log roll fence must be greater than the safe depth of bark.

The roll must also be buried at least 50 mm into the ground to keep it in place.



(d)	(i)	What height of log roll should Carla buy?		
		(2 marks		
	(ii)	How much will it cost for Carla to buy the log roll fencing she needs?		
		(4 marks)		

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### **END OF TASK C**

Task 3, page 13 Trampoline, baldari / shutterstock



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### **OXFORD CAMBRIDGE AND RSA EXAMINATIONS**

# LEVEL 2 FUNCTIONAL SKILLS MATHEMATICS

### **PRACTICE PAPER 3**

Mark Scheme

The maximum mark is 60

### **OCR Level 2 Functional Skills Maths Referencing for Coverage** and Range

Our ref	Coverage and Range
N1	understand and use positive and negative numbers of any
	size in practical contexts
N2	carry out calculations with numbers of any size in practical
	contexts, to a given number of decimal places
N3	understand, use and calculate ratio and proportion,
	including problems involving scale
N4	understand and use equivalences between fractions,
	decimals and percentages
A1	understand and use simple formulae and equations
	involving one- or two-step operations
G1	recognise and use 2D representations of 3D objects
G2	find area, perimeter and volume of common shapes
G3	use, convert and calculate using metric and, where
	appropriate, imperial measures
S1	collect and represent discrete and continuous data, using
	information and communication technology (ICT) where
	appropriate
S2	use and interpret statistical measures, tables and diagrams,
	for discrete and continuous data, using information and
	communication technology (ICT) where appropriate
S3	use statistical methods to investigate situations
S4	use probability to assess the likelihood of an outcome

	0 0 (
Representing	Our Ref
Understand routine and non-	R1
routine problems in familiar and	
unfamiliar contexts and situations.	
Identify the situation or problems	R2
and identify the mathematical	
methods needed to solve them.	
Choose from a range of	R3
mathematics to find solutions.	
Analysing	
Apply a range of mathematics to	A1
find solutions.	
Use appropriate checking	A2
procedures and evaluate their	
effectiveness at each stage.	
Interpreting	
Interpret and communicate	I1
solutions to multistage practical	
problems in familiar and unfamiliar	
contexts and situations.	
Draw conclusions and provide	12
mathematical justifications	

N – Number

A – Algebra G – Geometry S – Statistics

Task 1 Making lunch

	Process	Award	on evidence of
(a)(i)	Finding weekly spend (W)  [A]	2	2: £14.95 or or  1: 2.99 × 5 or 7 (figs 1495 or 2093)
(ii)	Finding annual spend (S)  [B]	2	<ol> <li>Number of working weeks in range 44 to 48 (N) seen or implied</li> <li>Annual spend (S) = N x W (followed through on correct answer to "N" x "W" but accept answer in range £657.80 to £717.60 (or 920.92 for 7day week) for full credit. Also accept by the route (365 – 28) x 2.99 = £1007.63 (days in year),</li> </ol>
(b)	Comparing fraction of daily allowance [C]	3	<ol> <li>Fat in meal deal (F) = 17.6 + 11.4 (= 29)</li> <li>95 ÷ 4 = 23.75 or 4 x" 29" (= 116) seen or equivalent (dividing the two quantities)</li> <li>Supported by relevant working: statement to the effect that Meal Deal is more than a quarter of 95 a "yes" is sufficient (but working must support this – lone "yes" and no working gains no credit). Following though on "F".</li> </ol>
(c)	Calculating fat content in own lunch  [D]		<ol> <li>Statement somewhere of what is needed for lunch eg bread, cheese, tomato, crisps [ 4 items (but not quantities) water is optional]</li> <li>Calculation of total amount of fat for all ingredients         Any three ingredients correct and total.         Allow sensible quantities i.e. can depart from below.         Sensible is: 1, 2, 3, 4 slices of bread, cheese 1, 2, tomatoes ½, 1 or 2, 1 bag of crisps         Condone fat for crisps: 8.3 or 11.4         (2 × 0.7 + 4.0 + 0.2 + 8.3 = 13.9)</li></ol>
	Comparing fat contents [E]	1	1: Correct comparison of "total" with "29g" (F), must have reference to original statement about "half as much fat".

	Process	Award	on evidence of
(d)	Costing items for annual cost of DIY lunch		1: For each "number" within given range with maximum of 3
	·		Condone lack of money units.
	[F]		
			1: If each of "correct" numbers correctly identified
			calculated from weekly costings
			Bread: (£) 16.28 to 76.96
			Cheese: (£) 42.90 to 101.40
			Tomatoes: $(£)$ 19.36 to $(£)$ 91.52
			Crisps: (£)30.62 to (£)45.24
			Water: (£)94.60 to (£)111.80
			calculated weekly costings
			Bread: 37 or 74 or 148
			Cheese: 97(p) or 98(p) or (£)1.95
		4	Tomatoes: $44(p)$ or $88(p)$ or $(£)1.76$
		_	Crisps: 69(p) or 87(p)
			Water: (£)2.15
			calculated daily costings
			Bread: 8p or 9p or 12p or 13p or 16p or 17p
			Cheese: 19p or 20p or 39p
			Tomatoes: 7p or 8p or 14p or 15p or 29p or 30p
			Crisps: 14p or 15p
			Water: 43p unless rational alternative
			If variety of time intervals used mark to candidates advantage.
			if <b>zero</b> scored
			1: For mention of all five components

Process	Award	on evidence of	
Calculating total annual cost [G]	1	1: By-eye correct total of at least 3 different items for the year.  (For weekly costings "Weekly total" x (44 – 52) weeks) then by-eye  (For daily costings "Daily total" x days (44 – 52) x (5 or 7) (308 days is common) then by-eye	
Calculating annual saving [H]	1	1: S – above DIY total (accept loss if stated as such and is consistent with candidates figures.) Must be correct money units, but if no symbol ⇒ £s	
Comparing saving with cost of laptop [I]	1	1: Consistent statement + explicit or implied laptop in cost range £200 to £800 or If loss correctly indentified and stated "no laptop".	
Checking		2: Clear evidence of a formal checking procedure being carried out at least once (e.g. by reverse calculation or repeating the calculation providing this is clearly a genuine check as opposed to a mere copying exercise).	
[J]		1: Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected	
		or	
	2	Three or more calculations relevant/valid for the task correctly performed, together with the absence of idiosyncratic part answers in the course of the task – these will usually be such that they are clearly at least two orders of magnitude different from the real-life quantity or measure.  Possible examples for this task might be prices/costs in £1000s	
		O: No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence.	
	Total 20		

Task 2 Using gas

	Process	Award	on ev	idence of		
(a)(i)	Interpreting graph (no gas used) [A]	1	1:	24 August or any time in range 10 3 <sup>rd</sup> week in August etc.	August to 31 August	
(a)(ii)	Interpreting graph (start of cold season) [B]	1	1:	October or November (condone an	actual date providing m	onth is correct)
(a)(iii)	Finding coldest month [C]	2	1: 1:	,		
(b)(i)	Calculating cost per quarter at higher rate [D]	2	1:	1143 x 3.675 must seen £42 or £42.00525 (or rounded to nea this mark dependent on first mark.	arest 1p) or £40.005 se	en
(b)(ii)	Calculating annual cost		1:	Evidence of use of "x figs 2676", ma or x one of the other tariff rates seen at	t least twice (i.e. figs ×3	
	[E]		2:	Cost for a quarter at lower rate (allow margin of $\pm 1(p)$ ) (1: each correct calculation or [answer] seen, maximum of 2):		f 2):
			Q1	[(6326 - 1143 or 5183) × 2.676]	[= 13869.708]	[figs 13870]
			Q2	[(1493 – 1143 or 350) × 2.676]	[= 936.6]	[figs 937]
		4	Q3	[(1301 – 1143 or 158) × 2.676]	[= 422.808]	[figs 423]
			Q4	[(6898 – 1143 or 5755) × 2.676]	[= 15400.38]	[figs 15400]
					or	
			1:	[16018 - 1143] or [14875] seen		
			1:	Total cost for 4 quarters (7) = £474.3 through (this in many respects repre		

	Process	Award	on evidence of
(c)	Comparing present cost with monthly		1: Will need to follow through on answer to b(ii) on previous page.
	payment scheme	2	Calculation of monthly cost " $T$ " ÷ 12 (=39.53±1p) or 45 × 12 (= 540)
	[F]		1: Alex correct with comparison seen or statement that his usage may increase
(d)	Comparison of tariffs and recommendation		2: (1: each correct [expression or its answer])
	as to the best		$C = [2680 \times \text{figs } 5.41485] = [\text{figs } 1451] +$
	rol		$[(16\ 018 - 2680)\ or\ 13338 \times\ figs\ 2.6208]\ = [figs\ 3495]$
	[G]		
			1: = £494.68 $\pm$ 2p this correct answer only
			(www can award above so 2+1 or www 2 for figs 4946)  or if zero scored above
			1: 16018 seen
		6	
			2: "Cost of online scheme" = 0.94 × "C" or equivalent (or =£465 www)
			Full follow through
			or 1: attempt to find 6% of "C" (finding 6% of "C")
			1: Recommendation based either "total cost" in year for both or "monthly cost" for
			both consistent with candidates presented figures
Checking	Checking		2: Clear evidence of a formal checking procedure being carried out at least
			once (e.g. by reverse calculation or repeating the calculation providing this
			is clearly a genuine check as opposed to a mere copying exercise).
			1: Clear recognition and relevant statement at any appropriate point that a
	[Н]		particular answer to a calculation is appropriate/expected or
	10.3		inappropriate/not expected
		2	or
			Three or more calculations relevant/valid for the task correctly performed,
			together with the absence of idiosyncratic part answers in the course of the task
			<ul> <li>these will usually be such that they are clearly at least two orders of magnitude</li> </ul>
			different from the real-life quantity or measure.
			<b>0:</b> No evidence of checking or consideration of reasonableness of answers –
			including bland statements to the effect that calculations were checked without
			any relevant evidence.
		Total 20	

Task 3 Trampoline

	Process	Award	on evidence of
(a)	Finding total cost of trampoline and anchor kit  [A]	2	2: (£)380 1: 365 + 15
(b)	Calculating diameter ( <i>D</i> )  [B]	2	2: 720 cm or 7.2 m or or  1: 360 (cm) and 180 (cm) seen (⇒ 540) or figs. 72
(c)	Showing suitable position for trampoline [C]	2	1: Use of 0.5 cm seen or implied (on drawing (± 2 mm) or in working)  1: Rectangle with correct region shaded (accept intent)  Or  1: A rectangle drawn sensibly the same distance in from the fence and the region between it and rectangle shaded or indicated in some way.
(d)(i)	Selecting height of roll needed  [D]	2	2: Height = 375 mm (£10.99) or 450 mm (£12.99) selected or  1: 300 or 350 (mm) seen or correct number but missing units or 1 correct and 1 wrong if two answers given
(d)(ii)	Calculating the circumference of the fencing round the safety area ( <i>C</i> )  [E]	2	<ul> <li>Circumference (C)= π × "D" (= 2232/2262/2261.(9))</li> <li> or</li> <li>Attempt to use of "2πr" or "π D" (i.e. 2 x π x "number" or π x "number" )</li> </ul>
	Finding number and cost of log rolls [F]	2	<ul> <li>1: Number of rolls (N) = "C" ÷ 180, rounded up to integer value (= 13)</li> <li>1: Cost = "N" × cost of roll of selected height (N must be the result of a calculation not just emerging from no apparent cause)</li> </ul>

	Process	Award	on evidence of
(d)(iii)	Finding number of bags of bark  [G]	4	<ol> <li>Use of consistent units for depth of bark layer thickness and radius of safety area (⇒ size of numbers 300→mm, 30→cm and 0.3→m with corresponding numbers for the "radius" or "diameter")</li> <li>Volume = π× 0.3 × ("D"÷2)² (allow inconsistent units) full follow through (i.e. figs: 12.05 / 12.21)</li> <li>or (1: correct formula selected) i.e. π x (number)² x fig 3</li> <li>Number and capacity of bags required stated</li> </ol>
	Finding cost of bark [H]	2	<ul> <li>(eg 6 x 2 m³ and 1 x 1 m³)</li> <li>1: Cost calculated (full follow through) from above <i>stated</i> number of bags.</li> <li>1: Comment at any point regarding their selection eg allowing for extra bark required or some left for topping up etc.</li> </ul>
Checking	Checking [I]		<ul> <li>Clear evidence of a formal checking procedure being carried out at least once (e.g. by reverse calculation or repeating the calculation providing this is clearly a genuine check as opposed to a mere copying exercise).</li> <li>Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected</li> </ul>
		2	Three or more calculations relevant/valid for the task correctly performed, together with the absence of idiosyncratic part answers in the course of the task – these will usually be such that they are clearly at least two orders of magnitude different from the real-life quantity or measure.  Possible examples for this task might be prices/costs in £1000s
		Total 20	No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence.