Functional Skills Qualification in Maths at Level 2
SAMPLE ASSESSMENT MATERIALS

OCR Functional Skills Qualification in Maths at Level 2

OCR code: 09866

The scheme code for these qualifications is:

OCR Functional Skills Qualification in Maths at Level 2   09866

Sample Assessment Materials

RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

LEVEL 2 FUNCTIONAL SKILLS MATHEMATICS

TASK AND ANSWER BOOKLET

This assessment may be taken within these dates:

TASK AND ANSWER BOOKLET 2010   **TIME: 1 HOUR 30 MINUTES**

INSTRUCTIONS

Fill in all the boxes below. Make sure your personal details are entered correctly. Use BLOCK LETTERS.

Centre name

Centre number

Your OCR candidate number

Your surname or family name

Your first forename (if any)

Your second forename (if any)

Date of birth

YOU NEED
- This task and answer booklet
- The Resource booklet for this test
- A pen with black ink
- A calculator
- A ruler

### YOU HAVE 1 HOUR AND 30 MINUTES TO COMPLETE THE 3 TASKS.

- Read the tasks inside this booklet carefully before starting the tasks
- Write your answers in this booklet
- **For each task, clearly show how your working leads to your answer**
- When you have finished, hand this booklet to the supervisor

QCA Accreditation Number – 500/8908/0

FOR EXAMINER USE ONLY		
Task No.	Mark	Total
1a	/1	
1b	/1	
1c	/3	
1d	/5	
1e	/4	
1f	/4	
1 check	/2	/20
2a	/2	
2b	/6	
2c	/2	
2d	/8	
2 check	/2	/20
3a	/4	
3b	/3	
3c	/6	
3d	/5	
3 check	/2	/20
Total	**/60**	**/60**

This document consists of 13 printed pages

[Turn over

Task 1   Mobile phone pouch

> **You will need the information on page 2 of the Resource Booklet**
> **You must clearly show how your working leads to each answer**
> **2 marks are available in each task when you show you have checked your work**

Jan has a market stall. She sells art and craft items.
She has an idea to make mobile phone pouches and sell them.
This is how she plans to make the pouches.
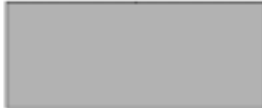
Cut out the fabric,
fold in half.

Then stitch the sides together,
leaving an open top

Finally turn inside out
and pop the mobile in!

Jan looks on a consumer website for the sizes and weights of the ten most popular mobiles.

(a) What is the modal thickness for the mobiles in Jan's list?

(1 mark)

(b) What is the modal width for these mobiles?

(1 mark)

(c) On average, how long are these mobiles?
Show and explain how you used Jan's information to decide.

(3 marks)

(d) Draw full-size the piece of fabric Jan needs to cut out for a pouch.
Give the dimensions of the piece of fabric.
Write down any working or assumptions that you use.

(5 marks)

OCR Functional Skills Qualification in Maths at Level 2

(e) Jan buys very cheap pieces of fabric. These come in 1.6 m widths and are about half a metre in length. They cost 50p each. Jan has free use of a sewing machine. She can make a mobile pouch in about 10 minutes.

NOTE: The national minimum wage is about £6 an hour.

Roughly how much does the material and labour cost to make a single pouch?

(4 marks)

(f) Before starting to sell the pouches Jan does some market research.
She makes sample mobile pouches and asks some people what they would be prepared to pay for a pouch.

(i) Use the results of Jan's survey to suggest what she should charge for a pouch, and explain why.

(3 marks)

(ii) How much profit would Jan make on each pouch?

(1 mark)

TASK CHECKING (2 marks)

Task 2   Chairs

> **You will need the information on page 3 of the Resource Booklet**
> **You must clearly show how your working leads to each answer**
> **2 marks are available in each task when you show you have checked your work**

A drama group is putting on *Grease* in a local hall.
The society wants to put as many chairs as possible in the hall for the audience.

The chairs are to be arranged in two equal size blocks.
Because of local Health and Safety regulations there must be at least a 2 m gangway round the two blocks of chairs.

(a)   What are the dimensions of one of the blocks of chairs?

(2 marks)

This shows the main measurements of one of the chairs to be used.

There should be leg room of at least 30 cm in front of each chair.

The chairs may be stacked for carrying.

The chairs are fixed together to form rows.

(b) **(i)** How many chairs will fit in a row across one block?

(2 marks)

(ii) How many chairs can be set out for the audience?

(4 marks)

OCR Functional Skills Qualification in Maths at Level 2

For the rest of this task you will need to make some **sensible** estimates.

(c) (i) What load, in kg, can someone of your age comfortably carry?

(1 mark)

(ii) Roughly how long would it take to carry this load for a distance of 10 m?

(1 mark)

Three members of the drama group, all about your age, set out the chairs in the hall.
All the chairs are stored by the stage.
Each chair weighs 4 kg.

(d) (i) How many chairs could someone of your age carry in a stack?

(1 mark)

(ii) Sarah sets out the back row. Estimate the total distance she walks doing this. Explain how you arrived at your answer.

(2 marks)

(iii) How long would it take the three members of the drama group to set out all the chairs in both blocks? Jot down any assumptions you make.

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Examiner use only

(5 marks)

Examiner use only

TASK 2 CHECKING (2 marks)

Task 3   Rainfall

> **You will need the information on page 4 of the Resource Booklet**
> **You must clearly show how your working leads to each answer**
> **2 marks are available in each task when you show you have checked your work**

Alain has two children and lives in Durham.
He is worried about his water bills.
Alain's water costs him 0.2 p a litre.

He finds this information on the Internet.

- Each time a toilet is flushed 8 litres of water is used
- A washing machine uses 65 litres a wash.

Alain and his children keep a tally for a week of how many times the toilet is flushed and the washing machine used.

Day	Toilet flushed	Washing machine machine used
Mon	///// ///// ///	
Tue	///// ///// //	/
Wed	///// /////	
Thu	///// ///// /////	/
Fri	///// ///// ///// /	
Sat	///// ///// ///// /////	/
Sun	///// ///// ///// ///// //	

(a) (i) How much water for flushing the toilet and using the washing machine do Alain and his children use in a week?

Examiner use only

(2 marks)

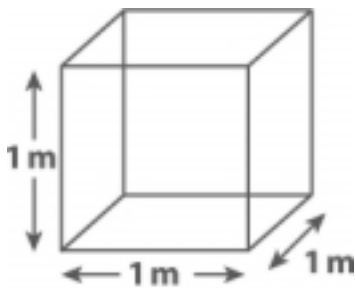**(ii)** Find how much this water will cost for a year.

Examiner use only

(2 marks)

1 mm depth of rain falling on 1 square metre (100 cm x 100 cm) is equal to 1 litre of water.

A cubic metre is 1000 litres.

These show a cubic metre.

Alain calculates:

one inch of rain falling on a rectangular area measuring 5 m by 8 m is equal to a cubic metre of water.

**(b)** Test out Alain's calculation. Show all your working.

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(3 marks)

Alain found this formula in a book about collecting rainwater.

$$W = kAr$$

W litres is the volume of water collected
from a roof of area *A*m² seen from above (the plan).
k is a number which depends on the type of roof.
r mm is the total depth of rain that has fallen.

The value of *k* is:
- 0.8 for a normal tiled roof
- 0.4 for a flat roof covered in gravel
- 0.5 for a flat brick roof.

$A = bc$
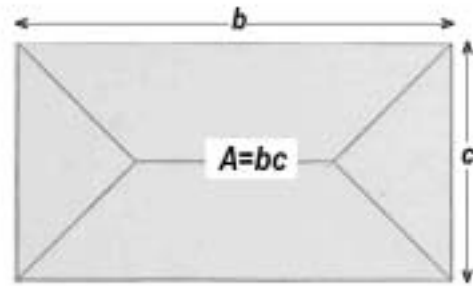
The monthly rainfall figures for Durham and a plan of the roof of Alain's house are shown in the Resource Booklet.

(c) **(i)** About what depth of rain falls in Durham in a year?

(1 mark)

(ii) In a year could Alain collect enough rainwater from his roof to use for the toilet and washing machine?

(5 marks)

It will cost £1800 to buy and fit a complete rainwater collection system. Alain will then save money on his water bill every year.

(d) **(i)** In how many years will Alain have saved the cost of the system?

(3 marks)

(d) **(ii)** Would you advise Alain to buy and fit the rainwater collection system?
Give two reasons for your answer.

(2 marks)

TASK 3 CHECKING (2 marks)

THIS IS THE END OF THE TEST

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

FUNCTIONAL SKILLS ASSESSMENT PILOT

LEVEL 2 FUNCTIONAL SKILLS MATHEMATICS   09866RB

SAMPLE ASSESSMENT MATERIAL 2010

RESOURCE BOOKLET

This booklet contains information needed to answer the tasks for the OCR Functional Skills Mathematics sample assessment 2010.

This document consists of 4 printed pages

Task 1   Mobile phone pouch

These are the 10 most popular mobile phones according to a website.

| Model	Size (mm)	Weight (g)
W395	48 x 100 x 15	109
880	47 x 86 x 15	96
P280	48 x 87 x 15	85
88D	49 x 89 x 14	81
K180	48 x 97 x 17	110
K77i	47 x 96 x 15	74
W9 E75	47 x 104 x 16	100
3GS5	48 x 106 x 15	131
GGG13	48 x 97 x 15	133
E75	47 x 94 x 15	126

Jan did a survey, asking her customers what they would be prepared to pay for one of her mobile phone pouches.

Here are the results of her survey.

How much would you be prepared to pay for one of these mobile phone pouches?	
£0 to £1.49	//
£1.50 to £2.49	//// //// //// //// //// //// //
£2.50 to £3.49	//// //// //// ///
£3.50 to £4.49	///
£4.50 to £5.49	//

Task 2   Chairs

This plan shows the arrangement of chairs, laid out in two blocks, in the hall
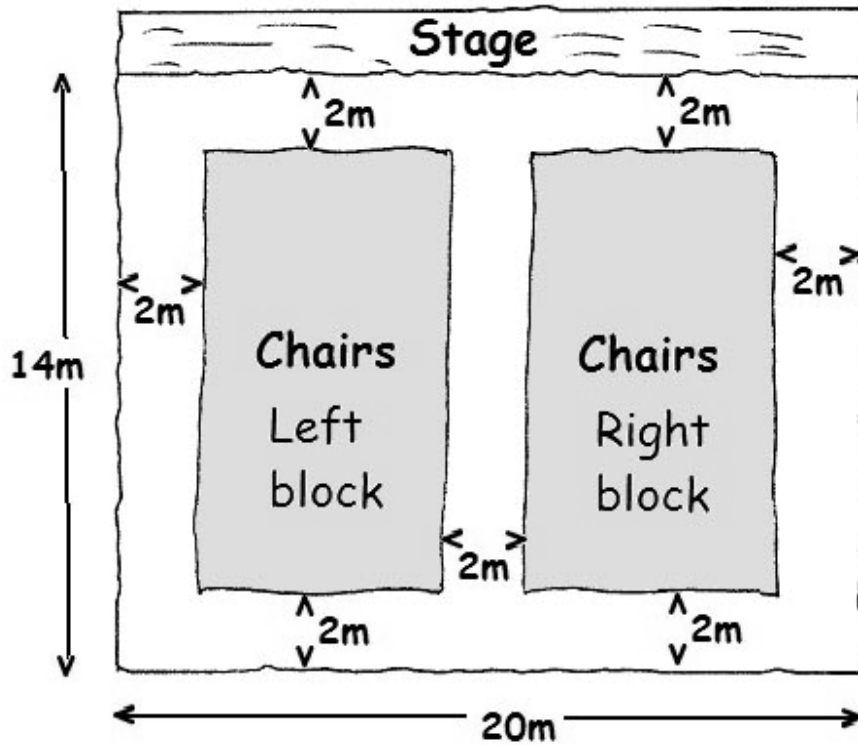
This shows the main measurements
of one of the chairs to be used.

There should be leg room of
at least 30 cm in front of each chair.

The chairs may be stacked for carrying.

The chairs are fixed together to form rows.

Task 3   Rainfall

Alain uses this information to calculate the amount of rainwater collected.

Monthly rainfall (mm) in Durham
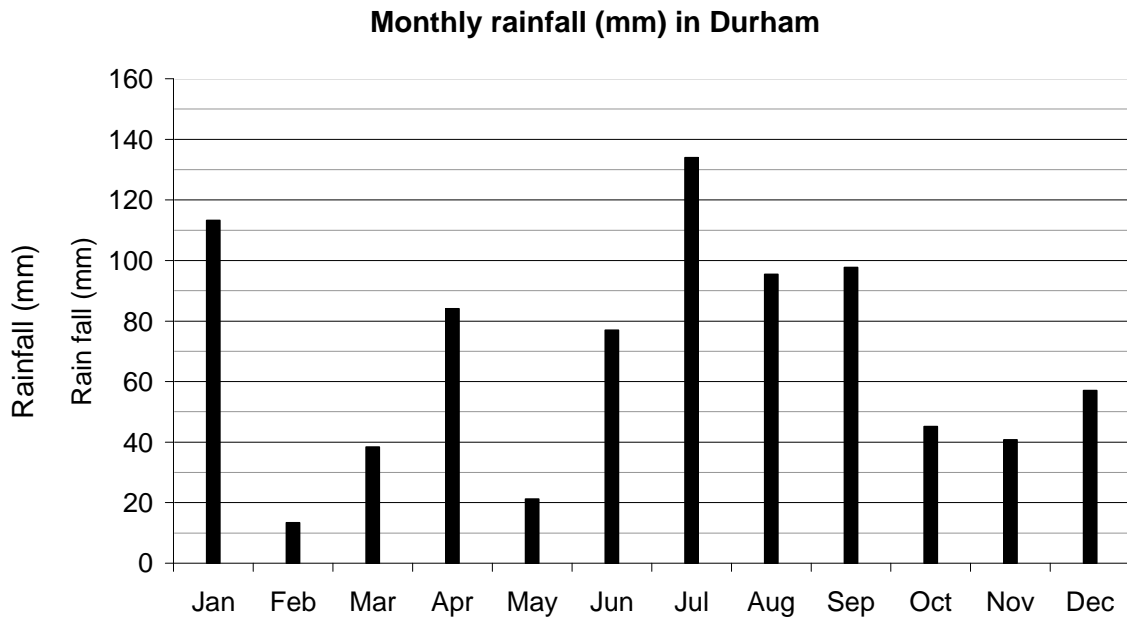
East Water charges Alain 0.2 p a litre for his water.

This is a rough plan of the roof of Alain's house.
It is a normal tiled roof.
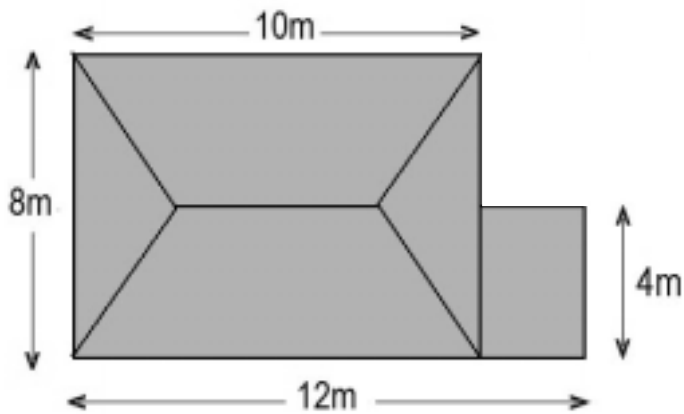
OCR FUNCTIONAL SKILLS
QUALIFICATION IN MATHS AT LEVEL 2

Specimen Mark Scheme

The maximum mark for this paper 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

Representing	Our Ref
Understand routine and non-routine problems in familiar and unfamiliar contexts and situations.	R1
Identify the situation or problems and identify the mathematical methods needed to solve them.	R2
Choose from a range of mathematics to find solutions.	R3
Analysing	
Apply a range of mathematics to find solutions.	A1
Use appropriate checking procedures and evaluate their effectiveness at each stage.	A2
Interpreting	
Interpret and communicate solutions to multistage practical problems in familiar and unfamiliar contexts and situations.	I1
Draw conclusions and provide mathematical justifications	I2

N – Number
A – Algebra
G – Geometry
S – Statistics

Mark Scheme

*Denotes closed response question

Task 1   Mobile phone pouch

	Process	Award	on evidence of …	Skill Standard		
(a)	**Finding modal mobile thickness* (S2, S3)**	**1**	15 or 1.5 (condone lack of units)	**R1**	**A1**	
(b)	**Finding modal mobile width* (S2,S3)**	**1**	48 or 4.8 (condone lack of units)			
	[A]	**2**				
(c)	**Finding typical length of a mobile phone (L) (S2, S3, N2)**	**3**	**3:** calculation of mean length = 956 ÷ 10 = 95.6mm and stated as the "average" **2:** for clear attempt to find mean length. (1 each for 956 or ÷ 10 seen **Or** **3:** Calculation of median = 96.5 mm stated to be the "average". **2:** As above but lacking overt statement. **1:** Clear attempt to order lengths **Or** Should candidate mistake length for width impose penalty of 1 and give full follow through on this for the rest of the question. ("total width" = 477, mean width= 47.7, median width = 48)	**R1** **R2**	**I1**	
	[B]	**3**				
(d)	**Drawing full-sized plan of fabric needed (G1, G3, N1, N3)**	**5**	**1:** Recognising that overlap is needed (may be implied not necessary to explicitly state). **1:** Account taken of thickness of mobile – allow follow through from (a) – but must be explicitly stared. **1:** Choosing a representative mobile length – seen or implied allow maximum, minimum, mean or median (allowing full follow through from (c)). "Playing safe" by using maximum dimensions is perfectly acceptable. **1:** Drawing of full-size consistent with above (but must have evidence of recognition that 2 x mobile representative length used) **1:** Drawing labelled with two principal dimensions, consistent with the above.	**R3** **R2**	**A1** **I2**	**I1**
	[C]	**5**				

(e)	**Costing the price of one pouch (G3, N1, N2)**	**4**	**2:** Clear attempt to find answer by fitting onto a sketch and answer (*N*) **or** **1:** Evidence of the above but no final answer, **Or** **1:** Calculation of area of fabric (A) and Calculation of number of pouches = $\frac{0.8}{A} \approx N$ (as inappropriate method maximum of 1) ---------- **1:** Calculation of wage for 10 minutes = £6 ÷ 6 = £1 **1:** Cost of 1 pouch = 50p ÷"*N*" = 1p and Total cost = £1 + "1p" = £1.01	**R1**	**A1** **A1**	**I1**
	[D]	**4**				
(f)(i)	**Choosing price per pouch based on survey result** **(S2, S3, N1)**	**3**	**3:** Most people willing to pay between £1.50 to £2.49 so choose £2 or similar + logical reason or **2:** in range 1.50 to 2.49 or valid reason outside or **1:** any price within table of results	**R2**	**A1**	**I1**
(f)(ii)	**Calculating unit profit* (N2)**	**1**	Profit therefore = £2 - £1.01 = £0.99		**I1**	
	[E]	**4**				
Checking	**Evidence of candidate checking procedures**	**2**	**2:** Clear evidence of a checking procedure being applied **1:** Any recognition that answers are appropriate/expected or inappropriate/not expected or no obvious errors **0:** Obvious incorrect answers or no evidence of checking or considering appropriateness of answer		**A2**	
A=7	**I=**	**Total 20**		**R=7**	**A=7**	**I=6**

Task 2   Chairs

	Process	Award	on evidence of …	Specification Criteria		
(a)	**Finding dimensions of a block of chairs*** **(G1, G3, N1, N2)**	1 1	Calculating length = 14 – 2 – 2 =10m Calculating width = 20 – 2- 2- 2 =14m for both blocks ie 7m for 1 block	**R1**		**I1**
	[A]	**2**				
(b)(i)	**Calculating number of chairs in a row*** **(N2, G1)**	2	Row is 7m, chair is 0.47m wide. **2:** Number of chairs = 7 ÷ 0.47 = 14.89... ie 14 chairs Condone 15 chairs iff appropriate comment made. **1:** Answer left as decimal or rounded up with no comment.	**R2**		**I2**
	[B]	**2**				

(b)(ii)	**Estimating total number of chairs in hall** **(N2, G1, G3)**	4	**1:** Each row is "worth" 0.47 m + 0.3 = 0.77
			1: Number of rows = "10" ÷ "0.77" = 12.98 or 12.88 number of rows per block = 12 or 13
			          Allow rounding up if reference is made to it
			1: Number of chairs in block "12" x "*R*"
			1: Number of chairs in the hall = 2 x above= 336 or
			          2 x 182 = 364. Accept answer between 300 and 400
			          Allow full follow through at each stage
				R3	**A1**
					A1
						I2

	[C]	**4**				
(c)(i)	**Estimating comfortable load to carry (G3)**	1	**1:** Accept answer between (10 and 25) kg (*W*)	**R1** **R2**		
(c)(ii)	**Estimating time to carry load above 10m** **(G3, N2)**	1	**1:** Statement of between 10 and 20 seconds (*T*)			
	[D]	**2**				
(d)(i)	**Calculating number of chairs in a stack** **(G3, N2)**	1	**1:** "*W*" ÷ 4. Accept between 2 and 5 – typically 4 would be about right – allowing for the fact it is a stack of chairs.			**I1**
	[E]	**1**				

(d)(ii)	**Estimating distance walked to fill back row (N2, G3)**	**2**	Many possible responses, award in the spirit of below eg distance from centre of stage to corner of block is about 14m, to middle of gangway = 12m, so mean distance could be 13m. Need 3 journeys per block so 3 x 13 = 39m double this for return gives 78m per block or 156m for both blocks. 1: estimating distance for 1 journey 1: final distance from estimating/calculating number of journeys (for a stated single journey seen or implied as the total number of journeys – no credit here).		**A1**	**I2**
		[F]	**2**			
(d)(iii)	**Calculating time to lay out the whole hall by three people (N2, G3)**	**5**	Many possible responses, award in the spirit of below. Allow full follow through wherever possible and be sensitive to working implied if this may be reasonably assumed. 1: Distance to back row = 13m and Distance to front row = 2m seen or implied 1: Mean distance = "7.5"m ie 15m including return or equivalent calculation – condone slip of not including walking back "empty" time or equivalent including assuming this to be a fraction of the time walking "full" i.e. with no load 1: "3" journeys per row per block = 6 per row in total and so total distance travelled = "6" x "15" = 90m 1: Time = 10* "90" ÷ their "*T*" 1: 3 workers so "Time" ÷ 3 If less than 5 scored, award 1 for any pertinent and obviously sensible comment made about times – such as allowing resting, tidying up etc.	**R1**	**A1** **A1**	**I1** **I2**
		[G]	**5**			
Checking	**Evidence of Candidate checking procedures**	**2**	2: Clear evidence of a checking procedure being applied 1: Any recognition that answers are appropriate/expected or inappropriate/not expected or no obvious errors 0: Obvious incorrect answers or no evidence of checking or considering appropriateness of answer		**A2**	
		Total 20		**R=6**	**A=7**	**I=7**

OCR Functional Skills Qualification in Maths at Level 2

Task 3   Rainfall

	Process	Award	on evidence of …	Specification Criteria		
(a)(i)	Calculating total water used by toilet and washing machine in a week (N2, S2)	2	**1:** Toilet flushes = 108, washing machine uses = 3 **1:** 108 x 8 + 3 x 65 = 1059 litres	R1	A1	
(a)(ii)	Costing annual cost of water for toilet flushes and using washing machine* (N2)	2	**1:** 1059 x 52 x 0.2 = 11013.6p **1:** = £110.14 allow follow through	R1 R2		
	[A]	4				
(b)	Checking a rainfall calculation (N2, G2, G3)	3	**1:** A cubic metre is 1000 litres **1:** 1mm gives 100 x 100 x 0.1cm³ = 1000cm³ = 1 litre **1:** 2.54/2.5 x 500 x 800 = 1016000/100000cm³ = 1016/1000litres (so he is about right)	R1	A1	I1
	[B]	3				
(c)(i)	Finding annual rainfall r from chart of monthly figures (S2)	1	**1:** Total is approximately 846mm. Accept between 800 and 900mm (r)			I1
	[C]	1				
(c)(ii)	Deciding by calculation if collected rainwater sufficient to use for toilets and washing machine. (A1, N2, G2)	5	**2:** Area of roof (A) = (8 x 10) + (2 x 4) = 88m² 1 for each term. **2:** Volume (V) = [0.8] x ["A"] x ["r"] /[1000] or (**1:** 2 or 3 terms correct) **1:** So yes sufficient water could be collected (allow full follow through on candidates' figures)	R3	A1 A1	I1 I2
	[D]	5				
(d)(i)	Calculating (informally) payback times (N2)	3	**1:** Annual saving = "V" x 0.2 (ignore units) (cannot be more than total toilet + washing machine annual consumption) **1:** payback time = 1800 ÷ ("V" x 0.2) (follow through) **1:** Answer to above must be result of correct units.	R2 R1		I1
		3				
(d)(ii)	Deciding on the advantages or disadvantages of installing a rainwater collection system (N1, N2)	2	**1:** each of two reasons supporting their decision e.g. good for environment too long to pay back (allow follow through) Allow mixture of positive and negative comments.			I1 I2
	[F]	2				
Checking	Evidence of Candidate checking procedures	2	**2:** Clear evidence of a checking procedure being applied **1:** Any recognition that answers are appropriate/expected or inappropriate/not expected or no obvious errors **0:** Obvious incorrect answers or no evidence of checking or considering appropriateness of answer		A2	
		Total 20		R=7	A=6	I=7

Total marks in Assessment allocated to closed response questions: 9/60 = 15%