OCR
Oxford Cambridge and RSA

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

LEVEL 2 FUNCTIONAL SKILLS MATHEMATICS 09866

TASK AND ANSWER BOOKLET PRACTICE PAPER 2

TIME: 1 HOUR 30 MINUTES

INSTRUCTIONS

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

Your surname or family name

Your first forename (if any)

Your second forename (if any)

Date of birth

Centre name

Centre number

Your OCR candidate number

At the beginning of this booklet you will find tear off Resource Documents. You will need to refer to these documents to complete the tasks.

You will also need:

- a pen with black ink
- a calculator
- a ruler

YOU HAVE 1 HOUR AND 30 MINUTES TO COMPLETE THE THREE TASKS

For each task, make sure that you:

- read the questions carefully before starting
- write your answers in this booklet
- clearly show how your working leads to your answers

2 marks are available in each task when you show you have checked your work.

When you have finished, hand this booklet and all the Resource Documents to the supervisor.

Ofqual Qualification Reference Number: 500/8910/9

FOR EXAMINER USE ONLY		
Question No	**Mark**	**Total**
TASK A		
1	/8	
2	/3	
3	/9	**/20**
TASK B		
1	/3	
2	/5	
3	/12	**/20**
TASK C		
1	/2	
2	/9	
3	/9	**/20**
Total	**/60**	

This document consists of 28 pages. Any blank pages are indicated.

  Registered Company Number: 3484466 **[Turn over**

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RESOURCE DOCUMENTS

The Resource Documents on pages 5, 7, 9, 11 and 13 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 and 13 along the perforated strip before removing from the task and answer booklet.

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TASK A – Sports injury

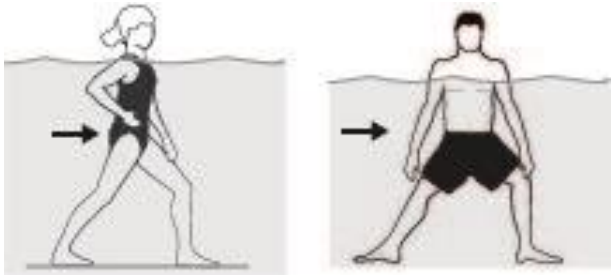
RESOURCE DOCUMENT 1

Information: exercise in water

These exercises should be done in water that is

- chest deep
- 78 - 86°F in temperature

Hip Exercises



Knee Exercise

Conversion table
1 mile = 1609.3 metres
1 foot = 0.3048 metres
1 mile = 5280 feet

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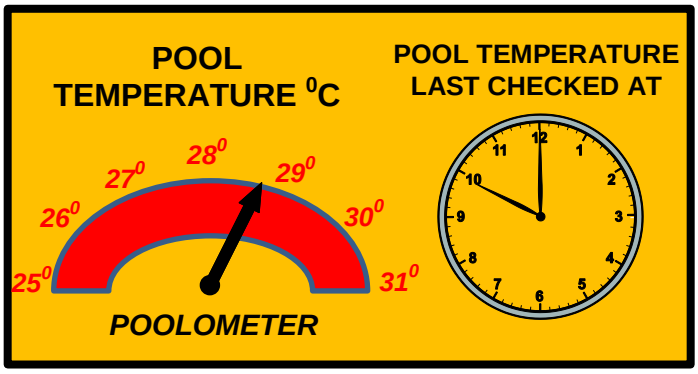
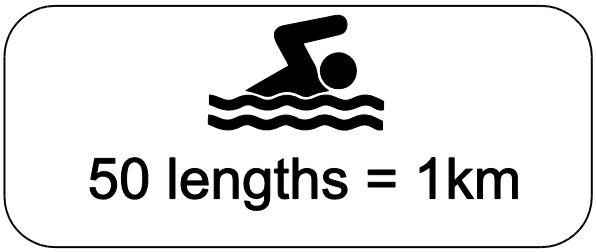
TASK A – Sports Injury

RESOURCE DOCUMENT 2

Information at Hightown Swimming Pool





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TASK B – Volcano Night

RESOURCE DOCUMENT 1

Calendar and Tide Table for Alnmouth

August

01 Thurs	05.34	LT	**02 Fri**	00.34	HT	**03 Sat**	01.37	HT	**04 Sun**	02.28	HT
	11.52	HT		06.50	LT		07.54	LT		08.44	LT
	18.14	LT		13.07	HT		14.10	HT		14.58	HT
				19.20	LT		20.17	LT		21.02	LT
05 Mon	03.10	HT	**06 Tues**	03.49	HT	**07 Wed**	04.23	HT	**08 Thurs**	04.56	HT	**09 Fri**	05.29	HT	**10 Sat**	06.03	HT	**11 Sun**	00.29	LT
	09.26	LT		09.64	LT		10.39	LT		11.13	LT		11.47	LT		12.21	LT		06.37	HT
	15.39	HT		16.16	HT		16.51	HT		17.24	HT		17.57	HT		18.30	HT		12.56	LT
	21.41	LT		22.16	LT		22.50	LT		23.23	LT		23.55	LT					19.05	HT
12 Mon	01.13	LT	**13 Tues**	01.44	LT	**14 Wed**	02.32	LT	**15 Thur**	03.33	LT	**16 Fri**	04.50	LT	**17 Sat**	06.18	LT	**18 Sun**	00.12	HT
	07.15	HT		07.57	HT		08.39	HT		09.54	HT		11.16	HT		12.43	HT		07.35	LT
	13.34	LT		14.17	LT		15.10	LT		16.17	LT		17.38	LT		18.59	LT		13.57	HT
	19.43	HT		20.28	HT		21.23	HT		22.33	HT		23.55	HT					20.07	LT
19 Mon	02.18	HT	**20 Tues**	03.12	HT	**21 Wed**	04.01	HT	**22 Thurs**	04.46	HT	**23 Fri**	05.27	HT	**24 Sat**	06.07	HT	**25 Sun**	00.35	LT
	08.39	LT		09.33	LT		10.20	LT		11.04	LT		11.45	LT		12.24	LT		06.45	HT
	14.58	HT		15.49	HT		16.35	HT		17.17	HT		17.56	HT		18.34	HT		13.02	LT
	21.04	LT		21.53	LT		22.37	LT		23.18	LT		23.58	LT					19.11	HT
26 Mon	01.13	LT	**27 Tues**	01.52	LT	**28 Wed**	02.36	LT	**29 Thurs**	03.30	LT	**30 Fri**	04.43	LT	**31 Sat**	06.11	LT						
	07.24	HT		08.04	HT		08.50	HT		09.49	HT		11.08	HT		12.36	HT						
	13.40	LT		14.20	LT		15.06	LT		16.07	LT		17.27	LT		18.49	LT						
	19.49	HT		20.29	HT		21.18	HT		22.22	HT		23.44	HT									

The sea comes in and goes out twice in every 24 hour period.
High Tide (HT) is when the sea is furthest in and **Low Tide (LT)** is when the sea is furthest out.
On most days, there are two high tides and two low tides. The times of the high and low tides change each day.
Tide tables give the times of the high and low tides each day for sailors and people using the beach.

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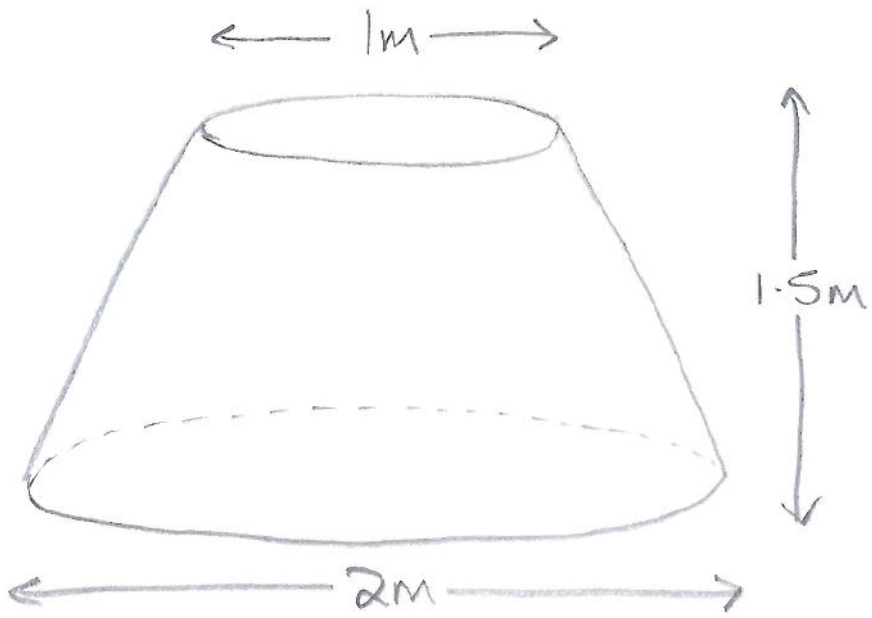
TASK B – Volcano Night

RESOURCE DOCUMENT 3

Zak's sketch of a mound of sand



Formula for volume of sand:

Volume of sand $= \left(\frac{7\pi h}{12}\right) \text{m}^3$ where h = height in metres

Use π = 3.14 or use the button on your calculator

Conversion table
1 m = 100 cm
1 cm^3 m^2 = 10 000 cm^2
1 cm^3 m^3 = 1 000 000 cm^3
1 litre = 1000 cm^3

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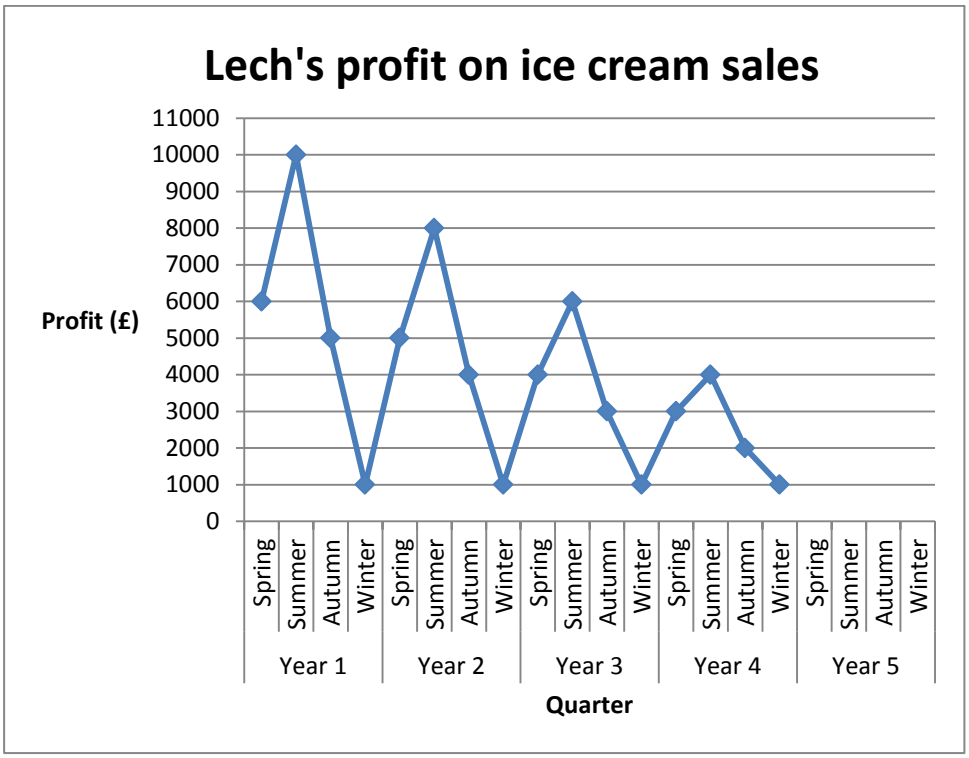
TASK C – Ice Cream Van

RESOURCE DOCUMENT 1



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TASK AND ANSWER PAGES

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

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TASK A – Sports Injury

You will need Task A Resource Documents1 and 2.

Alex is recovering from a sports injury.
His coach tells him to do some hip and knee exercises in water to help him get better.
He gives Alex an information sheet that explains what to do.

Alex is 6 feet tall.

Q1 (a) How tall is Alex in metres?

_____

_____

(2 marks)

(b) Is Hightown swimming pool the right depth for Alex to do the exercises?
Explain how you decide.

_____

_____

(2 marks)

Alex looks up this formula for converting °C to °F.

$$°F = (°C \times \frac{9}{5}) + 32$$

(c) Is Hightown swimming pool the right temperature for Alex to do the exercises?
Show your working.

_____

_____

_____

_____

_____

_____

_____

_____

(4 marks)

Examiner use only (Q1)

Alex reads that, in chest deep water, a person's weight is 90% less than when they are on land.
Alex weighs 75 kg when he is on land.

Q2 What is Alex's weight when he is in chest deep water?

Examiner use only (Q2)

(3 marks)

A different exercise is to walk for 20 minutes in water.

Alex finds that, in the water, it takes him 30 seconds to walk one length of the Hightown pool.

He says, "When I am not injured, I can run 5 miles in 30 mins. That must be 10 times faster than I can walk in water".

Q3 Is Alex correct? Show how you decide.

Examiner use only (Q3)

(7 marks)

Examiner use only (Checking)

Checking (2 marks)

Examiner use only (Total)

Total marks Q3 plus Checking

END OF TASK A

TASK B – Volcano Night

You will need Task B Resource Documents 1, 2 and 3.

Volcano Night is a competition held every year on the beach at Alnmouth.

Each team builds a mound of sand and lights a bonfire on top.

The winning team is the one whose bonfire burns for the longest as the tide comes in and washes away the mounds of sand.

The next Volcano Night will be held on the fourth Saturday in August.

Q1 **(a)** What date is the fourth Saturday in August?

_____

(1 mark)

The competition will start 4 hours after low tide.

(b) At what time will the competition start?

_____

_____

_____

(2 marks)

Examiner use only (Q1)

On Volcano Night, 15 members of the Youth Club decide to split into two teams.
They draw lots to see who will be in Team 1 and who will be in Team 2.
They put 15 counters in a bag.

- 7 of the counters have the number 1 written on them
- 8 of the counters have the number 2 written on them

Everyone picks a counter (without looking) until the bag is empty. The number on their counter decides which team they will join.

Zak picks first.

Q2 **(a)** What is the probability that Zak joins Team 1?
Give your answer as a fraction.

_____

_____

_____

(2 marks)

After the teams have been chosen, Anya (A), Bill (B), Chris (C) and Davinder (D) arrive.
Two of them will join each team.

(b) Complete the following table to show **all** the different ways they could be paired.
Two have been done for you.

Team 1		Team 2
A and B	+	C and D
C and D	+	A and B

Examiner use only (Q2)

(3 marks)

[Turn over

Zak does a sketch to show the size and shape of the mound he thinks his team should build.

Q3 (a) What is the volume of the sand in the mound Zak wants to build?
Give your answer in m^3.

(4 marks)

(b) How many cm^3 of sand are in the mound Zak wants to build?

(2 marks)

Davinder says, “That mound is too big! We have 9 people in our team and each person has a 2 litre bucket. Each of us will have to collect more than two hundred bucket-loads of sand!"

(c) Is Davinder right? Show how you decide.

(4 marks)

Examiner use only (Q3)

Checking (2 marks)

Examiner use only (Checking)

Total marks Q3 plus Checking

Examiner use only (Total)

END OF TASK B

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TASK C – Ice Cream Van

You will need Task C Resource Document 1

Lech has an ice cream van.
His newspaper says, “In the 1950s there were about 20,000 ice cream van operators in Britain – now there are less than a quarter of that number.”

Q1 Estimate how many ice cream van operators there are in Britain now.

Examiner use only (Q1)

(2 marks)

Lech looks at a graph of his profits from ice cream sales in the last four years.

Q2 (a) What was Lech’s total profit in year 4?

(3 marks)

(b) Lech says, “My yearly profits have decreased by 55% since year 1”.
Is he correct? Explain how you decide.

(4 marks)

(c) What would you estimate Lech’s profits will be in year 5 if the trend continues?

Examiner use only (Q2)

(2 mark)

Lech parks for 20 minutes in one place for people to buy ice creams. He then drives for 4 minutes to his next stop. He keeps doing this for as long as he is working.

Lech's van has a musical jingle to tell people that his van is nearby.

The law states that he is allowed to play the jingle

- only when the van is moving
- for 12 seconds every two minutes
- only between noon and 7pm.

Q3 What is the maximum total time that Lech can play the jingle in one day?
Give your answer in minutes and seconds.

(7 marks)

Examiner use only (Q3)

Examiner use only (Checking)

Checking (2 marks)

Total marks Q3 plus Checking

Examiner use only (Total)

END OF TASK C

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OCR
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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

LEVEL 1 FUNCTIONAL SKILLS MATHEMATICS

PRACTICE PAPER 2

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

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

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

FS Maths Marking Guidance

TASK A – Sports Injury

Part	Process	Award	On evidence of….	Exemplification Notes	R	A	I	Coverage/range
Q1(a)	Converting feet to metres [A]	**2**	**2:** 1.83 (m) **1:** 6 x 0.3048	accept 1.8288	**R1** **R3**			**G3**
Q1(b)	Estimating chest height [B]	**2**	**1:** "1.83" = (20 to 60cm) (=1.23 to 1.63) **1:** Yes or no based on comparison of their estimate with 1.4m	Must be explicit estimate of "chest deep" within range	**R2**		**I2**	**N2**
Q1(c)	Applying formula [C]	**3**	**C to F** **3:** 83.3 to 84.2 seen or **1:** 28.5 to 29 used **1:** attempt to use formula with at least 1 correct stage completed (x9, ÷5 or +32) **1:** second correct stage completed **F to C** **3:** 25.55 to 30 seen or **1:** 78 to 86 used **1:** attempt to use formula with at least 1 correct stage completed (÷9, x5 or -32) **1:** second correct stage completed		**R3**	**A1**	**I1**	**A1**
	Making decision [D]	**1**	**1:** Yes or no based on comparison of their temperatures				**I2**	**N1**
Q2	Calculating a percentage reduction [E]	**3**	**3:** 7.5 (kg) oe if units clear or **1:** 0.1 seen and **1:** 0.1 × 75 or **1:** (0.9 x 75) attempted (=67.5) **1:** 75 = "67.5" (=7.5)		**R3**	**A1** **A1**		**N2**
Q3	Finding speed in water [F]	**3**	**1:** length = 20 (m) and **2:** 1.5 miles per hour or 2.4 km per hr oe		**R1**	**A1**	**I1**	**N2 N1 G3**

Part	Process	Award	On evidence of….	Exemplification Notes	R	A	I	Coverage/range
	Finding running speed [G] Comparing speeds [H] Making decision [I]		**1:** 40 x 60 **1:** "40" x 60 (=2400 m or 2.4 km per hour) (= 1.5 miles per hr) oe					
		1	**1:** 10 miles/hr or 16(.093) km/hr oe			**A1**		
		2	**1:** comparison using same **units** (may be implied by units in F and G) **1:** 10 ÷ "1.5" or 16 ÷ "2.4"or x10 or ÷10				**I1** **I1**	
		1	**1:** Yes or no based on their speeds	ignore incorrect units			**I2**	
	Checking	**2**	**2:** Clear evidence of a checking procedure being carried out at any appropriate point in the task that isn't simply a reverse calculation **or**. Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected **1**: checking by reverse calculation or at least 3 correct and appropriate calculations seen or implied. **0:** No evidence of checking or consideration of reasonableness of answers – including bland statements to the effect that calculations were checked without any relevant evidence			**A2** **A2**		
	TOTAL	**20**			**6**	**7**	**7**	

Process	R	A	I	Coverage	a	b	c	d	e	f	g	h	i	j	k	l
Total																

FS Maths Marking Guidance

TASK B – Volcano Night

Part	Process	Award	On evidence of	Exemplification Notes	R	A	I	Coverage/range
Q1 (a)	Reading calendar [A]	**1**	**1:** 24 (th)		**R1**			**S2**
Q1 (b)	Interpreting tide tables [B]	**2**	**2:** 16.24 or 4.24 pm **1:** 12.24	Allow sensible rounding eg about 4.30 pm	**R1** **R2**			**S2**
Q2 (a)	Expressing probability [C]	**2**	**2:** 7/15 **1:** 7 as numerator or 15 as denominator		**R2**		**I1**	**S4**
Q2 (b)	Listing possible pairings [D]	**3**	**1:** first correct row **1:** second correct row **1:** third and fourth correct rows	A and C + B and D B and D + A and C A and D + B and C B and C + A and D **rows in any order**	**R2**		**I1** **I1**	**S3**
Q3 (a)	Use formula to calculate volume [E]	**4**	**4:** 2.625 to 2.748 (m^3) or **1:** 1.5 seen **1:** $7 \times \pi \times$ "h" **1:** ÷ 12	Allow 2.6 or 2.62 but not 3	**R3**	**A1** **A1** **A1**		**A1 N2 G2**
Q3 (b)	Converting m^3 to cm^3 [F]	**2**	**2: "**2 625 000" **1:** 1 000 000 seen		**R3**	**A1**		**G3**
Q3 (c)	Finding number of buckets per person [G]	**3**	**3:** 145 to 153 or **1:** ÷ 1000 (litres) **1:** ÷ 2 (buckets) **1:** ÷ 9 (buckets per person)		**R3**	**A1**	**I1**	**N1 N2**
	Making decision [H]	**1**	**1:** Yes or no based on their calculations				**I2**	**N1**
	Checking [I]	**2**	**2:** Clear evidence of a checking procedure being carried out at any appropriate point in the task that isn't simply a reverse calculation **or**. Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or			**A2** **A2**		

Part	Process	Award	On evidence of	Exemplification Notes	R	A	I	Coverage/range
			inappropriate/not expected **1**: checking by reverse calculation or at least 3 correct and appropriate calculations seen or implied. **0:** 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**			**8**	**7**	**5**	

Process	R	A	I	Coverage	a	b	c	d	e	f	g	h	i	j	k	l
Total																

FS Maths Marking Guidance

TASK C – Ice Cream Van

Part	Process	Award	On evidence of	Exemplification Notes	R	A	I	Coverage/range
Q1	Estimating number of van operators	**2**	**2:** 3000<n<5000 oe **1:** 5000 seen		**R1** **R2**			**N2**
Q2(a)	Interpreting graph	**3**	**3:** 10000 **2:** 3000 + 4000 + 2000 + 1000 **1:** at least two numbers correctly read from graph		**R1** **R2**		**I1**	**S2 N2**
Q2(b)	Finding % decrease Making comparison	**3**	**3:** figs 54....or 55 seen or **1:** 22000 **1:** "22000" = "10000" (=12000) **1:** "12000"/"22000" **1:** x100		**R3**	**A1** **A1**	**I1**	**N1 N4**
		1	Yes or no based on their calculations				**I2**	
Q2(c)	Using trend to predict	**2**	**2:** 5000 ≤ n ≤ 7000 1: 1000 ≤ n < 10 000		**R3**			**S3**
Q3	Finding total time	**5**	**1:** 7 hours seen (noon to 7pm) **1:** "7" x 60 (=420 mins) **1:** "420"/24 (=17.5 driving periods) **1:** driving periods x 2 (=35) (number of times jingle played) **1:** number of times x 12 (time jingled played for in secs (=408)	if fail to ÷24 allow ft: **1:** "420" ÷ 2 (=210 lots of 2 minute periods) **1:** "210" x 12 (=2520, total time in seconds)	**R2**	**A1**	**I1** **I1** **I1**	**N2**
	Converting time	**2**	**2:** 6 mins 48 s **1:** 6.8 mins or "408" ÷ 60	**2:** 42 mins 0 s **1: "**2520" ÷ 60 (= 42)	**R2**		**I2**	**G3**
	Checking	**2**	**2:** Clear evidence of a checking procedure being carried out at any appropriate point in the task that isn't simply a reverse calculation **or**. Clear recognition and relevant statement at any appropriate point that a particular answer to a calculation is appropriate/expected or inappropriate/not expected **1**: checking by reverse calculation or at least 3 correct and appropriate calculations seen or implied. **0:** No evidence of checking or consideration of reasonableness of answers –			**A2** **A2**		

Part	Process	Award	On evidence of	Exemplification Notes	R	A	I	Coverage/range
			including bland statements to the effect that calculations were checked without any relevant evidence					
	TOTAL	**20**			**8**	**5**	**7**	

Process	R	A	I	Coverage	a	b	c	d	e	f	g	h	i	j	k	l
Total																