

Surname						Other Names					
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For Examiner's Use

General Certificate of Secondary Education
 Functional Skills Certificate
 January 2009



MATHEMATICS (PILOT)
Functional Mathematics Level 2
Paper 2 (Functionality)
Calculator allowed

93001/2

Wednesday 14 January 2009 1.30 pm to 2.45 pm

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments • a copy of the data book (examination) (enclosed). 	
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For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
TOTAL	
Examiner's Initials	

Time allowed: 1 hour 15 minutes

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Answers written in margins or on blank pages will not be marked.
- Use a calculator where appropriate.
- Do all rough work in this book.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The maximum mark for this paper is 60.
- The marks for questions are shown in brackets.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.



J A N 0 9 9 3 0 0 1 2 0 1

Answer **all** questions in the spaces provided.

1 Environmentally Friendly Cars

You will need to use the **Data Sheet for Environmentally Friendly Cars** to answer this question.

1 (a) What were the average emissions of CO₂ from new cars in 1997?

Answer grams/km (1 mark)

1 (b) What is the difference in CO₂ emissions, per kilometre, between the Supermini and the Small MPV?

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Answer grams (2 marks)

1 (c) Fred says that the graph shows the average emissions of CO₂ from new cars in 2003 were about half of what they were in 1999.

Explain why he is wrong.

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(1 mark)



1 (d) There is a target to reduce average emissions of CO₂ from new cars to 120 grams/km by 2012.

Does the graph suggest that this target will be met?
Explain your answer.

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(2 marks)

1 (e) Sara drives her son to and from school.
These journeys total eight kilometres each day.
She drives a large car with CO₂ emissions of 291 grams/km.
Her son says that he should walk instead of being driven.

What would be the reduction in CO₂ emissions in a five-day school week?

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Answer grams (3 marks)

Question 1 continues on the next page

Turn over ►



- 1 (f) Rashid has a Volvo S80 which has CO₂ emissions of 198 grams/km.
He drives about 25 000 kilometres each year.
He wants to reduce the emissions by 50%.
Here are three options.

Option A	Use the same car and drive fewer kilometres each year.
Option B	Change his car to one of the cars from the data sheet and still drive about 25 000 kilometres each year.
Option C	Change his car to one of the cars from the data sheet and drive fewer kilometres each year.

Describe how Rashid can reduce the emissions by 50% using each option.
You **must** show working to justify your answer.

- 1 (f) (i) Option A

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Answer Car Volvo S80

Distance driven km (1 mark)

- 1 (f) (ii) Option B

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Answer Car

Distance driven 25 000 km (1 mark)



1 (f) (iii) Option C

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Answer Car

Distance driven km (4 marks)

15

Turn over for the next question

Turn over ►



2 London Eye

You will need to use the **Data Sheet for London Eye** to answer this question.

2 (a) In which year did work start on building the London Eye?

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Answer (1 mark)

2 (b) A group of 110 students go on the ride.

What is the least number of capsules that they need?

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Answer (2 marks)

2 (c) Jim and Nick queue for the London Eye.

2 (c) (i) Jim works out that the maximum number of passengers that can be safely carried on the London Eye is 800.

Show how Jim could have worked this out.

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(2 marks)

2 (c) (ii) At 1.15 pm Nick estimates there are 1600 people in front of them in the queue.

Estimate the time that Jim and Nick will finish their ride.

You **must** show your working.

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Answer (4 marks)



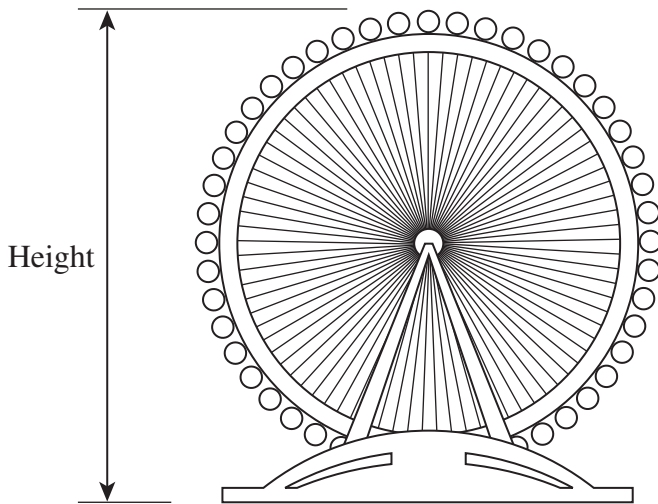
- 2 (d) You are given that $\pi \times \text{diameter} = \text{circumference}$
 Maral is at the highest point of her ride.

Work out how high she is above the lowest capsule.

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Answer metres (3 marks)

- 2 (e) In China a taller wheel than the London Eye is being built.
 It is called the Great Beijing Wheel.
 A scale drawing of the Great Beijing Wheel is shown.



Scale 1 cm = 32 m

Work out the height of the Great Beijing Wheel.

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Answer m (3 marks)



3 National Minimum Wage

The minimum wage for workers was increased on 1 October 2007.

The table shows the minimum wage before and after the increase.

Age group	Minimum wage per hour	
	Before 1 October 2007, £	From 1 October 2007, £
16 to 17 years old	3.30	3.40
18 to 21 years old	4.45	4.60
22 years old and over	5.35	5.52

- 3 (a) How much did the minimum wage per hour for a 24-year-old worker increase on 1 October 2007?

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Answer pence (1 mark)

- 3 (b) In November 2007 John worked for 80 hours.
He was 19 years old and was paid the minimum wage.

How much did he earn in November 2007?

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Answer £ (2 marks)



- 3 (c) Before 1 October 2007 Rosa paid rent of £120 per month.
From 1 October 2007 her rent increased by 5%.
She was 17 years old and was paid the minimum wage.
She worked for 124 hours each month.

Was she better off or worse off each month from October 2007?
You **must** show your working.

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Answer (4 marks)

Question 3 continues on the next page

Turn over ►



- 3 (d) The table gives some information about the national minimum wage for eight countries in Europe.

Country	Adult minimum wage per month in euros (€)	Percentage of adults receiving the minimum wage
Spain	660	0.8
Malta	580	1.5
Portugal	470	4.7
France	1250	16.8
Hungary	260	8.0
Estonia	230	4.8
Lithuania	170	10.3
Romania	110	9.7

The first three entries in the table are plotted on the scatter graph opposite.

- 3 (d) (i) Complete the scatter graph.

- 3 (d) (ii)

The higher the minimum wage, the greater the percentage of adults who receive the minimum wage.

Comment on this statement.

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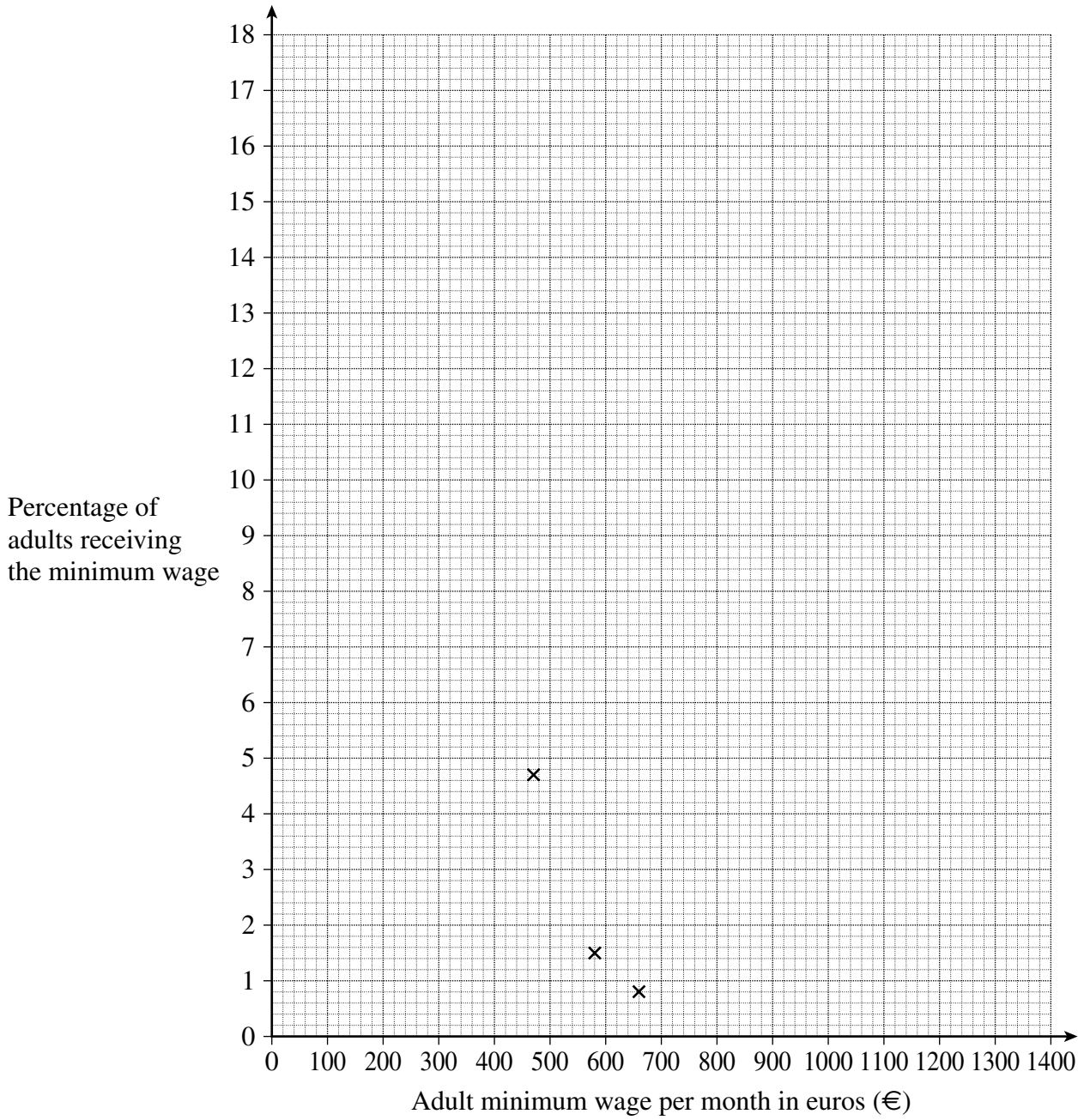
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(2 marks)





(1 mark)

10

Turn over ►



4 Fairtrade UK Sales

You will need to use the **Data Sheet for Fairtrade UK Sales** to answer this question.

- 4 (a) What was the value of sales of chocolate / cocoa in 2003?

Answer £ (1 mark)

- 4 (b) In which year did sales of coffee first go above £30 million?

Answer (1 mark)

- 4 (c) How many years did it take for sales of bananas to approximately double from their value in 2000?

Give a reason for your answer.

Answer years

Reason

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(2 marks)



4 (d) The sales of coffee have increased each year.

What is the average increase per year between 2000 and 2005?
Give your answer to the nearest million pounds.

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Answer £ million (3 marks)

4 (e) The price of cocoa is set in New York.
The table shows the price that Fairtrade pays its suppliers.

New York price per tonne	Fairtrade price per tonne
\$1600 or less	\$1750
more than \$1600	New York price + \$150

One day, the New York price for cocoa is \$1400 per tonne.

What percentage more than this does Fairtrade pay its suppliers?

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Answer % (3 marks)

10

Turn over ►



5 Activity Holidays

You will need to use the **Data Sheet for Activity Holidays** to answer this question.

- 5 (a)** What is the price per night for a 15-year-old staying in July?

Answer £ (1 mark)

- 5 (b) (i)** Lakehouse charges a school £135 for each pupil on a school trip.
One-third of this cost is paid by the school.
Pupils pay the rest of the cost.

How much does each pupil pay?

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Answer £ (2 marks)

- 5 (b) (ii)** The trip is booked for 50 pupils.
Lakehouse state that for every eight pupils there must be at least one member
of staff.

Work out the smallest possible number of staff needed for the trip.

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Answer (2 marks)



There are no questions printed on this page

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