Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

Functional Skills Certificate
FUNCTIONAL MATHEMATICS

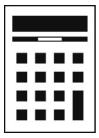
Level 2

Wednesday 18 May 2016 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments
- a copy of the data book (examination) (enclosed).



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.
- State the units of your answer where appropriate.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 60.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.
- Evidence of checking is specifically assessed in Questions 1(d) and 4(a). These questions are indicated with a †.

Advice

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

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

1 **Camping in France**

There is a **data sheet** for Camping in France.

Four friends are going on a 7-night camping holiday in France.

They decide to

take their car on the ferry from Portsmouth to Caen

start their holiday on Saturday 5th June

return on the ferry.

1 (a) They choose these ferry times

Portsmouth to Caen 1445

Caen to Portsmouth 1630

Circle the **total** cost for the ferry journeys.

[1 mark]

£378 £388 £410 £508

1 (b) The friends book

one tent for 3 nights at Lez Eaux

and

one tent for 4 nights at La Foret.

They get a 5% discount on the costs of the ferry journeys and the campsites.
They divide the total cost equally between them.

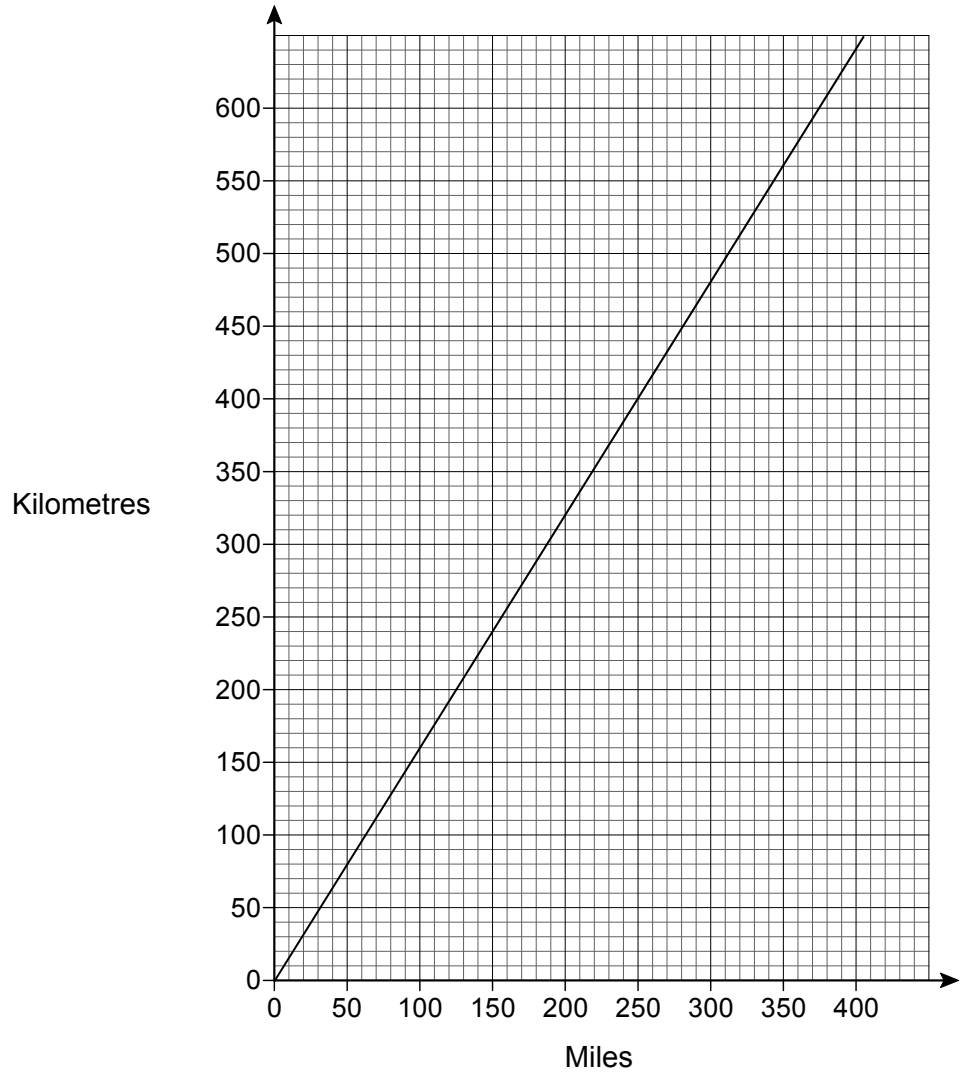
Do **each** of the four friends pay less than £200 for the ferry journeys and campsites?
You **must** show your working.

[4 marks]

In France, the friends expect to drive a total of 960 kilometres.

1 (c) Show that 960 km is the same as 600 miles.
Use this graph to help you.

[2 marks]



†1 (d) Their car travels 40 **miles** for each gallon of petrol.
Petrol costs £5 per gallon.

Work out the cost of the petrol they expect to use in France.

[2 marks]

Check your answer.
Show how you have done your check.

[1 mark]

Question 1 continues on the next page

1 (e) The Jones family are planning a **14-night** camping holiday in France.

After they arrive in Caen they want to

- stay at three or four campsites, including Point St Gilles
- return to Caen to catch the ferry home.

They will drive between each place.

They can drive 75 km each hour.

They want to drive for less than five hours on each journey.

Write a possible plan for their holiday, including

the names of campsites

the number of nights at each campsite

the distance of each journey.

[5 marks]

15

2 Market stall

Kim

2 (a) Kim buys

150 mugs at £1.25 each
80 pans at £3.60 each
35 kettles at £4.50 each

She sells **all** the mugs, 30 pans and 20 kettles at these prices.

Mugs	Pans	Kettles
£1.80 each	£5.20 each	£6.00 each

She sells **all** the remaining pans at half price.
She sells **all** the remaining kettles with a 60% reduction in price.

Kim says,

"I have made a profit of more than £75"

Is she correct?
You **must** show your working.

[9 marks]

2 (b) On Saturday, Tom, Ali, Wes, Liz and Kim all work on the stall.

There are always three of the five people working on the stall.

Tom can only work up to 1 pm

Ali works for **exactly** 3 hours.

Wes works for **exactly** 4 hours.

Nobody works for more than 4 hours without a break of at least one hour.

Complete a possible rota.

[4 marks]

Practise on this grid.

9 am - 10 am			
10 am - 11 am			
11 am - 12 noon			
12 noon - 1 pm			
1 pm - 2 pm			
2 pm - 3 pm			

Put your answer on this grid.

9 am - 10 am			
10 am - 11 am			
11 am - 12 noon			
12 noon - 1 pm			
1 pm - 2 pm			
2 pm - 3 pm			

13

3 **School newspaper**

Laura works on the school newspaper.

Each newspaper has
6 pages printed in black and white
and
2 pages printed in colour.

Laura

3 (a) It takes 3 seconds to print a page in black and white.
It takes 4 seconds to print a page in colour.

How much time will it take to print 1500 copies of the newspaper?
Give your answer in hours and minutes.

[4 marks]

3 (b) Each copy of the newspaper costs 11p to make.

1500 copies are made.

1140 copies will be given free to students.

The **other** copies will be on sale for 50p each.

Laura says,

"We will make a profit if we sell 90% of the **other** copies."

Is she correct?
You **must** show your working.

[5 marks]

There is enough space for 450 lines of writing in the newspaper.

3 (c) Laura already has 50 lines of writing.
This table shows the number of words in each of these lines.

Number of words	Number of lines
12	4
13	8
14	16
15	12
16	7
17	2
18	1
Total	50

Show that the total number of words in the 50 lines is 720

[2 marks]

3 (d) On average there are 720 words in every 50 lines of writing.

Laura says,

"For 450 lines of writing there should be about 6500 words."

Is she correct?
You **must** show your working.

[4 marks]

15

Question 4 starts on page 16

Turn over for the next question

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

4 **Solar panels**

There is a **data sheet** for Solar panels.

I want solar panels on my roof.

Joe

†4 (a) Joe makes these notes.

> I will have to pay £7100 for the solar panels.
>
> I will make these savings each year
>
> £120 (from not buying as much electricity).
>
> £530 (from what I am paid for the electricity I make).

Work out the number of years it will take Joe to make savings of at least £7100

[3 marks]

Check your answer.
Show how you have done your check.

[1 mark]

4 (b) Each solar panel has a capacity of 250 watts.

Joe wants solar panels with a total capacity of 4 kW

Show that he needs 16 solar panels.

[1 mark]

4 (c) Joe estimates the electricity made from solar panels with a total capacity of 4kW

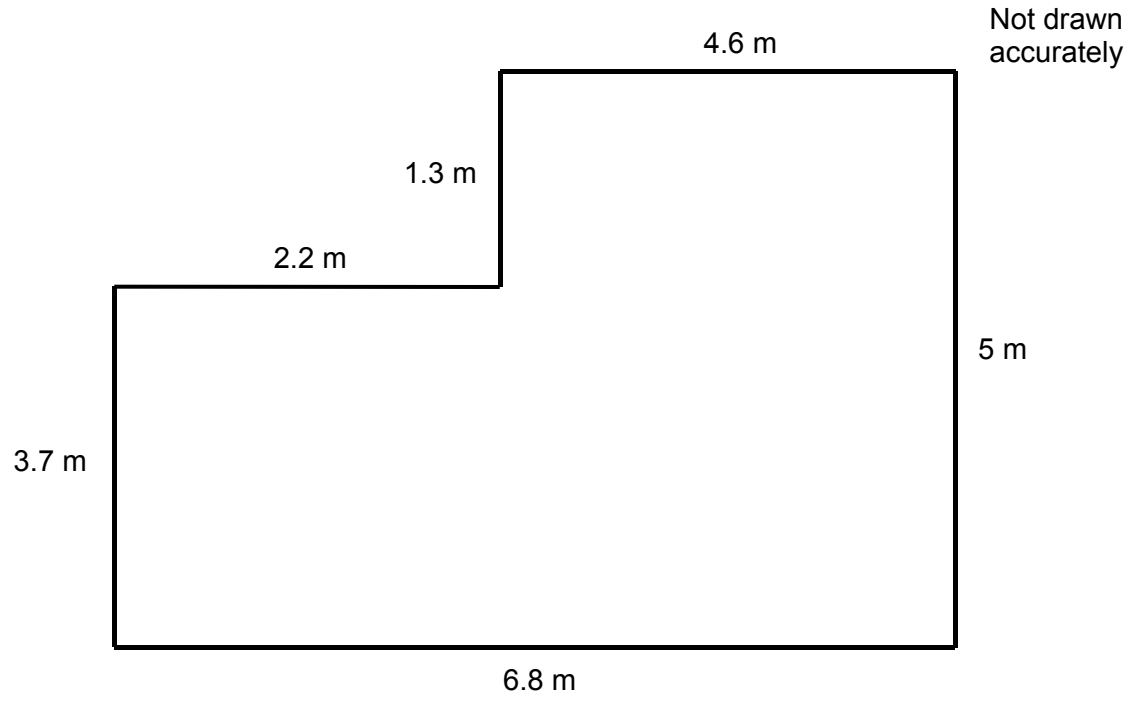
He uses the steps on the data sheet.

He uses an efficiency factor of 0.35
He does this for August, when $n = 10.3$ and $s = 4.5$

Is his estimate more than 400 units?
You **must** show your working.

[5 marks]

4 (d) The diagram shows the space available for solar panels on Joe's roof.



Each solar panel is a rectangle 1.575 m by 1.082 m

Joe says,

"16 solar panels can fit on the roof."

Is he correct?
You **must** show your working.

[5 marks]

Question 4 continues on the next page

4 (e) Sally has solar panels on her roof.

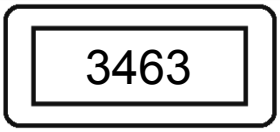
She can work out the total that she is paid (£P) using this formula

$$P = 0.1768Y$$

Y is the number of units of electricity made in a year.

The number of units of electricity made by the solar panels is shown on a meter.

Here is her meter at the end of 2014



Here is her meter at the end of 2015

How much should Sally be paid in total for the electricity made in 2015?
Give your answer to the nearest 10 pence.

[2 marks]

17

END OF QUESTIONS