

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

Functional Skills Certificate

FUNCTIONAL MATHEMATICS

Level 2

Tuesday 1 March 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(b) and 2(d). 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 Dance studio
There is a **data sheet** for Dance studio.

1 (a) Sue has a new room in her studio.
Here is a scale drawing of the floor in this room.

Scale 1 cm represents 2 m



The dance teacher needs 8 m² of floor space.

Sue says,

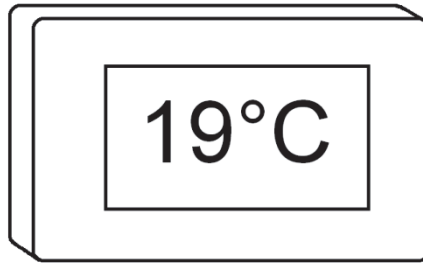
“The teacher can take a class of 15 juniors **or** 9 seniors in this room.”

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

[6 marks]



- †1 (b) The temperature in a dance class should be at least 65°F
Sue reads the temperature one morning.



Show that the temperature is above 65°F

[2 marks]

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

[1 mark]

Turn over for the next question



Turn over ►

1 (c) The table shows information about the classes each Saturday.

	Time	Number of juniors	Number of seniors
Room A	09.30 to 10.30	16	
	10.30 to 11.30	12	
	11.30 to 12.30		10
Room B	09.30 to 10.30		8
	10.30 to 11.30	14	
	11.30 to 12.30	15	
Room C	09.30 to 10.30		13
	10.30 to 11.30		11
	11.30 to 12.30		7



Each junior pays £4 for a lesson.

Each senior pays £6 for a lesson.

Sue's costs each Saturday are

£180 in total for dance teachers

£90 for other costs.

She says,

"I make more than £250 profit each Saturday."

Is she correct?

You **must** show your working.

[5 marks]

14

Turn over for the next question



2 Football

There is a **data sheet** for Football.

2 (a) The normal cost of a season ticket is £375
Here are two ways you can buy a ticket.

Option 1
Pay 35% of the normal cost now
and
Pay 6 monthly payments of £49.50

Option 2
Pay 9 monthly payments of £56.75

Amy says,

“Option 2 costs over £80 more than Option 1”

Is she correct?

You **must** show your working.

[5 marks]



2 (b) Amy takes a train from Aigburth station.
 She wants
 to arrive at Kirkdale station between 2 pm and 2.15 pm
 the total time from Aigburth to Kirkdale to be as short as possible.

Plan her journey.
 Include stations and times.

[4 marks]

Turn over for the next question



- 2 (c)** To get **to and from** Rovers' football ground, Dev travels
by train between South Parkway and Sandhills
by Soccerbus between Sandhills and the ground.

Here are some prices for the train.

South Parkway to Sandhills

Single £5.25

Return £5.70

The price of a ticket for each game is £21.50

Dev has saved £340 for tickets and travel during the season.

How many games can he afford to go to during the season?

You **must** show your working.

[4 marks]



Mal has some Golden Goals tickets to sell.

†2 (d) The time on each ticket is a different multiple of 15 seconds.

The lowest time on a ticket is 0 minutes 15 seconds.

The highest time on a ticket is 90 minutes 0 seconds.

Show that he has 360 tickets to sell.

[1 mark]

Check your answer.

Show how you have done your check.

[1 mark]

2 (e) Mal expects to sell three-quarters of the 360 tickets.

He wants to give

half of the money from ticket sales to charity

at least £75 to charity.

Work out the **minimum** amount he should charge for a ticket.

Give your answer to the nearest 10p

[3 marks]

18



3 Day centre

Day centres provide lunch and activities for retired people.



I run a day centre.

David

3 (a) On Wednesday, lunch starts with tomato soup.

To make tomato soup for 4 people you need

- 1.5 kg of tomatoes
- 1 onion
- 1 carrot
- 2 tablespoons of tomato purée
- 2 stock cubes
- 2 pints of water



3 (b) Each day, from Monday to Saturday, David needs

- 2 drivers
- 1 cook
- 2 helpers.

These people can work next week.

The table shows when they can work and the jobs they can do.

Name	When they can help	Driver	Cook	Helper
Andy	Any two days		✓	✓
Ben	All six days	✓	✓	
Cathy	Thursday, Friday and Saturday	✓	✓	✓
Don	All days except Monday and Tuesday	✓		✓
Ellie	Monday, Tuesday and Friday	✓	✓	✓
Farah	Any three days	✓		
Gary	Thursday and Saturday	✓	✓	
Hasim	All six days		✓	✓
Ian	Wednesday and Saturday		✓	✓

Complete a rota for next week.

[4 marks]



Practise on this grid.

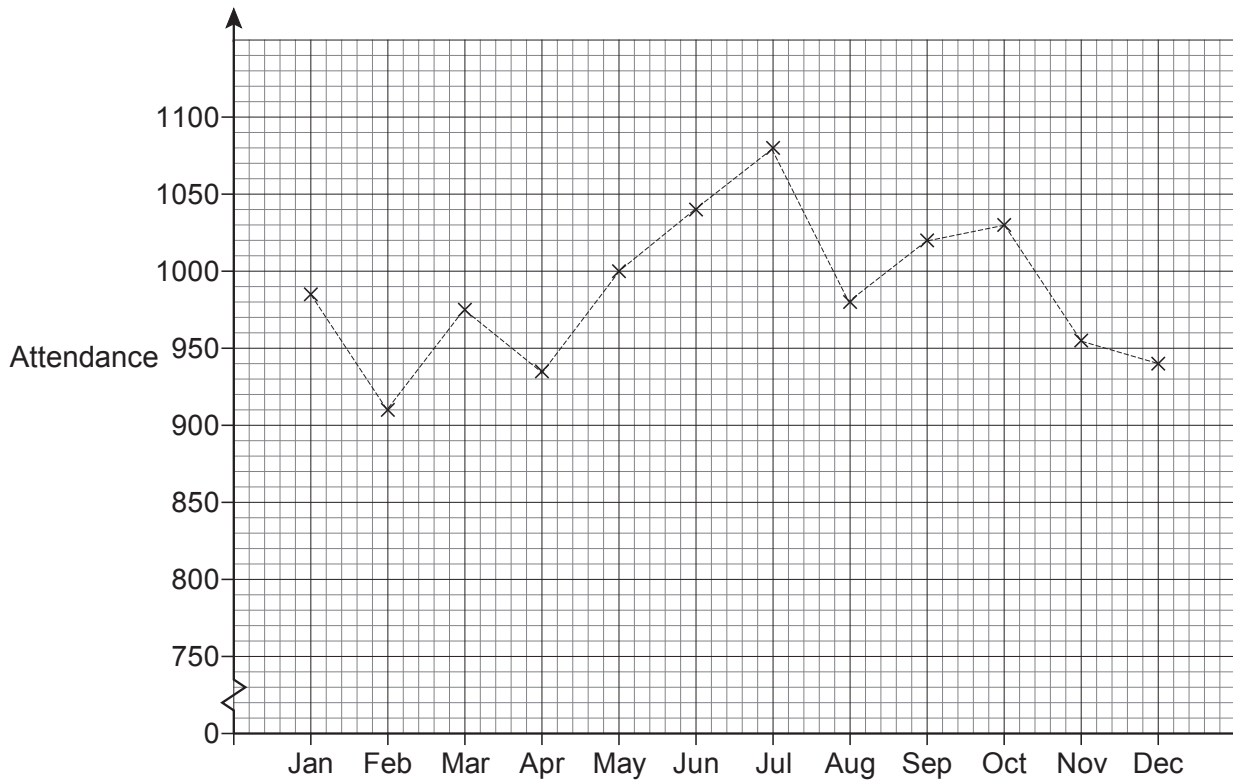
Day	Drivers		Cook	Helpers	
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					

Put your answer on this grid.

Day	Drivers		Cook	Helpers	
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					



3 (c) The graph shows the monthly attendance at the centre in 2015



The centre lost money when the monthly attendance was less than 960

In how many months did the centre lose money?
Circle your answer.

[1 mark]

3

4

5

6



Question 3 continues on the next page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**



3 (d) The centre made a loss in 2015
David is working out a budget for 2016
He assumes
 each person attending pays for a lunch
 the same number of people attend in 2016 as in 2015

	2015	2016
Number of people attending	11 850	11 850
Amount paid per lunch	£3.60	£4.10
Grant	£63 200	£65 000
Cost of running the centre	£110 500	£114 000

A grant is money given to the centre to help pay the costs.

The centre needs more money to
 pay back the loss made in 2015
 and
 pay the cost of running the centre in 2016

How much **more** money does the centre need?

[7 marks]



4 Great North Run

Chris

I am taking part in the Great North Run,
which starts in Newcastle.

4 (a) Chris drives to Newcastle.

The distance is 75 miles.

He expects his average speed to be 50 miles per hour.

How much time should his drive take?

[2 marks]



- 4 (b) During the run, Chris records the times for each of the first 21 kilometres.
He rounds each value to the nearest half-minute.

Time (minutes)	Frequency
4.0	2
4.5	6
5.0	9
5.5	3
6.0	1
Total	21

Chris wants to know his mean time per kilometre.

Work out an estimate of his mean time per kilometre.
You **must** show your working.

[3 marks]

Turn over for the next question



4 (c) Runners can take bottles of water at points A, B and C along the course.

There are 50 000 runners in the race.

The organisers think that

$\frac{7}{10}$ of the runners will take a bottle at point A

$\frac{2}{5}$ of the runners will take a bottle at point B

80% of the runners will take a bottle at point C.

Will 90 000 bottles be enough?

You **must** show your working.

[5 marks]

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END OF QUESTIONS

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