

Please write clearly in block capitals.

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Candidate number

Surname _____

Forename(s) _____

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Functional Skills Certificate

FUNCTIONAL MATHEMATICS

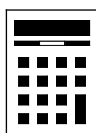
Level 2

Monday 6 November 2017 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 3(c) and 4(b). These questions are indicated with a †.

Advice

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

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
TOTAL	



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ANSWER IN THE SPACES PROVIDED**



0 2

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

1 Pets Corner

There is a **data sheet** for Pets Corner.

1 (a)



I am going to Pets Corner by
train and bus.

Amy

Amy catches a train at 1.35 pm from Durham Station.
The train takes 16 minutes to travel to Central Station.
Amy then catches the next number 38 bus.

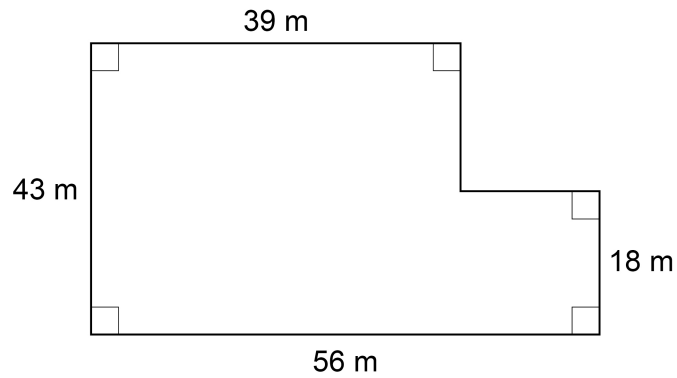
What time should this bus arrive at Corner House?

[2 marks]

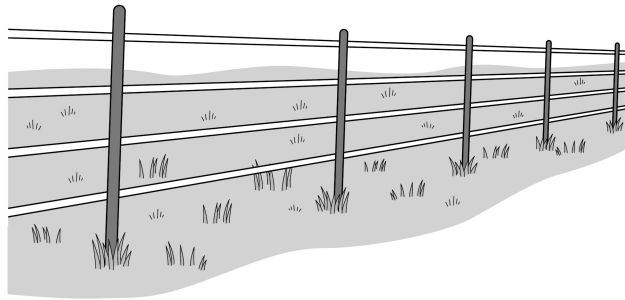
Question 1 continues on the next page



Joe is making an enclosure for alpacas.
Here is a sketch of the fence for the enclosure.



- 1 (b) The fence has 4 rows of electric tape.



Electric tape is sold in rolls.
Each roll has 150 m of tape.

Joe says,
"I need to buy five rolls."

Is he correct?

You **must** show your working.

[5 marks]



1 (c) 1 acre = 4840 square yards

Joe says,

“The enclosure will be big enough to keep three alpacas.”

Is he correct?

You **must** show your working.

[6 marks]

13

Turn over for the next question



2 Supermarket

Raj is the manager of a supermarket.

2 (a) Workers in the supermarket work in shifts.

Each day there are shifts in the morning, the afternoon and the evening.

Each person can work a maximum of two shifts each day.

Raj needs Amy, Ben, Cathy, David and Eva to work the following shifts next week.

Monday	1 worker for the evening shift
Tuesday	1 worker for the evening shift
Wednesday	1 worker for the evening shift
Thursday	2 workers for each of the three shifts
Friday	2 workers for each of the three shifts
Saturday	2 workers for each of the three shifts
Sunday	1 worker for the afternoon shift

This table shows when Amy, Ben, Cathy, David and Eva can work next week.

Amy	can only work evening shifts
Ben	can only work on Thursday, Friday and Saturday
Cathy	cannot work on Monday or Friday
David	can only work on Friday and Saturday
Eva	can only work on Thursday and Friday

Work out a possible rota for Amy, Ben, Cathy, David and Eva for next week.
Show your rota on the opposite page.

[3 marks]



Show your rota in the space below.

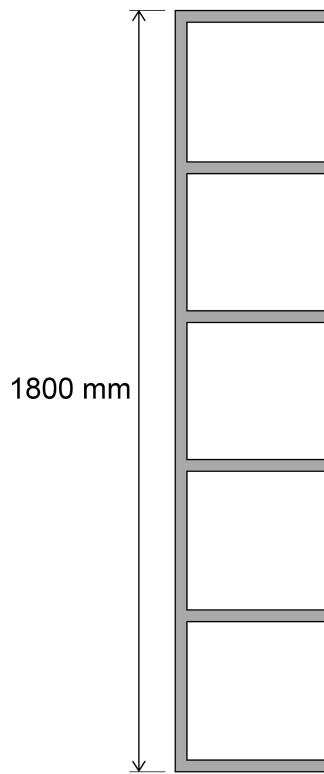
Question 2 continues on the next page



0 7

Turn over ►

2 (b) Here is a set of shelves in the supermarket.



Not drawn
accurately

Each of the **six** shelves is 20 mm thick.
Each gap between the shelves is the same.

A bottle of lemonade is 320 mm high.

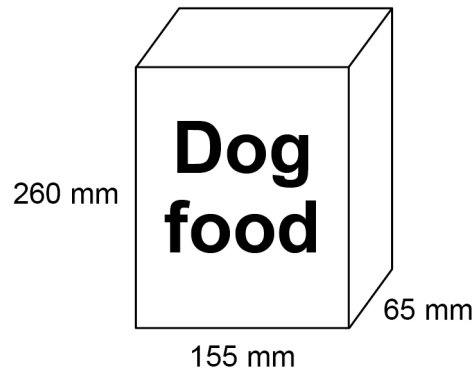
Will the bottle fit on the bottom shelf?

You **must** show your working.

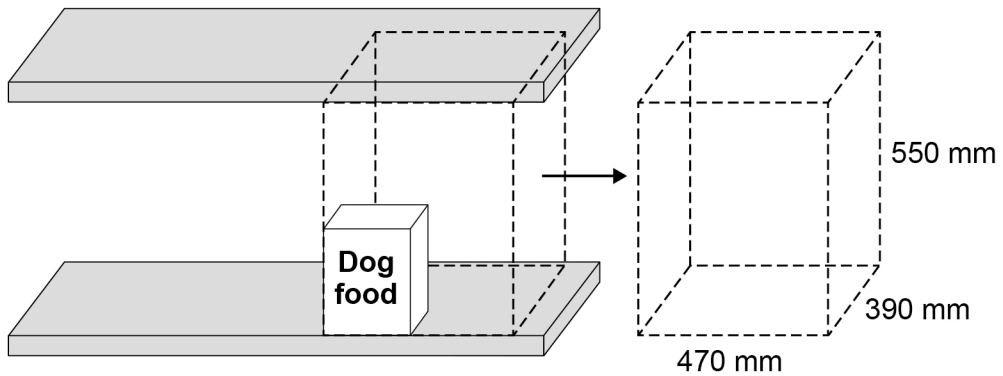
[4 marks]



- 2 (c) Raj puts these boxes of dog food on another set of shelves.



He stacks the boxes in the space within the dotted lines shown on this diagram.



The space is shaped like a cuboid with

height 550 mm

width 470 mm

depth 390 mm

Work out the maximum number of boxes of dog food that can fit in the space.

You **must** show your working.

[4 marks]



2 (d) Raj buys and sells plastic carrier bags.
He pays £11.41 per 1000 bags.
He uses this to work out the cost per bag.
He sells the bags for 5p each.
He gives 80% of the **profit** on each bag to a local charity.
One month he sold 384 carrier bags.
How much did Raj give to the charity for that month?

[5 marks]

16



3 Water

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

3 (a) Mia uses her dishwasher 15 times.
Circle the amount of water this uses.

[1 mark]

45 litres 57 litres 225 litres 675 litres

3 (b) Liam normally uses 1200 litres of water each week.
One week he decides to save water.

Normally, he has 3 baths each week.
He decides to have 3 showers instead.
He puts a brick in the toilet cistern.
This saves 1.5 litres of water each flush.
He flushes the toilet 30 times that week.

He says,

“This saved $\frac{1}{6}$ of the total amount of water I normally use each week.”

Is he correct?

You **must** show your working.

[7 marks]



Turn over ►

Ella, Seema and Jane are going to share a house for the whole of 2018



Ella

Seema

Jane

The house does **not** have a water meter.
Altogether they will use 450 **litres** of water per day.

†3 (c) How many **cubic metres** of water will the three girls use in the whole of 2018?

[2 marks]

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

[1 mark]



3 (d) Here are the ways they can pay their water charges for the year.

With a water meter

£134
plus
£2.96 per cubic metre of water used

Without a water meter

12 fixed monthly payments of
£53.50

The girls want the cheapest way to pay for the water they will use.

Should they have a water meter fitted?

You **must** show your working.

[5 marks]



Turn over ►

4 Swimming

- 4 (a)** One event in a swimming competition is the men's 100 metres freestyle.
Here are the times from the two semi-finals.

Semi-Final 1		Semi-Final 2	
Name	Time (seconds)	Name	Time (seconds)
Ralf	53.37	Tom	53.23
Simon	53.49	Zain	53.14
Harry	53.70	Paul	52.93
Cheng	52.97	Kev	52.88
Ahmed	52.92	Dai	53.20
Ian	53.26	Greg	53.66
Mike	53.28	Yan	53.28
Jack	52.83	Louis	53.57

The eight fastest swimmers from the semi-finals go into the final.
Each swimmer in the final is given a lane number.
The table below shows how the lane numbers are decided.

Time in semi-finals	Lane number
1st fastest	4
2nd fastest	5
3rd fastest	3
4th fastest	6
5th fastest	2
6th fastest	7
7th fastest	1
8th fastest	8



Complete the table for the final.

[4 marks]

Lane number	Name
1	
2	
3	
4	
5	
6	
7	
8	

- †4 (b) The winning time in the final is 52.28 seconds.
The competition record is 51.91 seconds.
How much slower is the winning time than the record time?

[1 mark]

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

[1 mark]



4 (c) Beth and Daisy are members of a swimming club.
They both swim in 100 metres backstroke races.

Here are their times, in seconds, for their races in 2017

Beth

65.7 66.6 67.4 63.6 65.2 64.8 66.5 64.9 68.5 66.8

Daisy

62.5 63.2 67.4 62.6 64.2 66.2 64.8 65.9

For the next race the club wants to choose the better swimmer.

Use the data to decide which swimmer the club should choose.

You **must** show your working.

[4 marks]



4 (d) Erin is the manager of a junior swimming team.



I need to buy swimming kit for six swimmers.
I also need to hire a minibus.

Erin

She sees these adverts

Swimming kit	
Swimsuit	£46.95
Swim cap	£6.50
Tracksuit	£62.95
15% off orders over £500	

Minibus Hire
£370

Erin wants to buy each of the six swimmers a swimsuit, swim cap and tracksuit.
Show that it will cost **less than** £1000 for the kit and minibus.

[5 marks]

END OF QUESTIONS

15



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