Write your name here

Surname		Other names

Centre Number

Candidate Number

Mathematics
Level 2

17 – 21 July 2017
Time: 1 hour 30 minutes

Paper Reference
FSM02/01

You must have:
Pen, calculator, HB pencil, eraser, ruler graduated in cm and mm, protractor, compasses.

Total Marks

My signature confirms that I will not discuss the content of the test with anyone until the end of the 5 day test window.

Signature: _____

Instructions

- Use a **black** ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Sign the declaration.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The total mark for this paper is 48.
- The marks for each question are shown in brackets
  – *use this as a guide to how much time to spend on each question.*
- **You must show clearly how you get your answers because marks will be awarded for your working out.**
- **Check your working and your answers at each stage.**
- **This sign shows where marks will be awarded for showing your check.**

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.

Turn over ▶

Pearson

SECTION A: Bank

Answer all questions in this section.

Write your answers in the spaces provided.

1 Amir is the manager of a bank.
He is going to do some market research.

Amir will ask some bank customers these questions.

- Do you have a savings account?
  (yes, no)

- What is your age?
  (18–24, 25–49, 50 and over)

- What is your yearly income?
  (less than £15 000, between £15 000 and £30 000, more than £30 000)

Amir needs to design a data collection sheet to collect this information.

Design a data collection sheet for Amir.

(3)

Use the box below to show your data collection sheet.

(Total for Question 1 is 3 marks)

2 Amir has this information about the number of new customers in 2016

Age group	Number of new customers	Number of new customers who opened a savings account
18–24	2479	178
25–49	4383	1954
50 and over	7295	5961

Amir needs to give some of this information as percentages.

(a) What percentage of the number of new customers aged 18–24
opened a savings account?
Give your answer correct to 2 decimal places.

(2)

Use the box below to show clearly how you get your answer.

Amir needs to write a report about the wages of bank employees.
He has this information about all the bank employees in his branch.

Employee	A	B	C	D	E	F
Monthly wages	£1600	£2400	£1600	£7500	£2700	£2500

Amir works out that the mean monthly wage of these bank employees is £3050
He wants to work out the median and the range of these monthly wages.

(b) Work out the median and the range of these monthly wages.

(3)

Use the box below to show clearly how you get your answer.

(c) Explain why Amir uses the median monthly wage rather than the mean monthly wage in his report.

(1)

Use the box below to write your explanation.

(Total for Question 2 is 6 marks)

Turn over ▶

3 Magda wants to start saving money.

She gets £1650 a month after tax.
Magda needs to make these payments each month

- rent – £780
- bills – £135
- shopping – £170

After making these payments each month, Magda will put 60% of the money she has left into her savings account.

She thinks that after one year she will have put more than £4000 into her savings account.

Is Magda correct?
Show why you think this.

(4)

Use the box below to show clearly how you get your answer.

(Total for Question 3 is 4 marks)

4 Magda has £1000 in her savings account.
She has 265 euros left over from her last holiday.
She puts this money into her savings account.

When Magda puts this money into her savings account, the bank converts the euros into pounds using £1 = 1.1452 euros.

The bank deducts a fee of £0.79 from her savings account for this conversion.

How much money does Magda now have in her savings account?

(3)

Use the box below to show clearly how you get your answer.

(Total for Question 4 is 3 marks)

Turn over ▶

Answer all questions in this section.

Write your answers in the spaces provided.

5 Kei is a landscape artist.
A client asks Kei to landscape his garden.

Kei designs a fish pond for the garden.
The pond needs

- a circular space with diameter 2.5 m
- to be at least 0.5 m from the path and from the fence
- to be at least 1.5 m from the house.

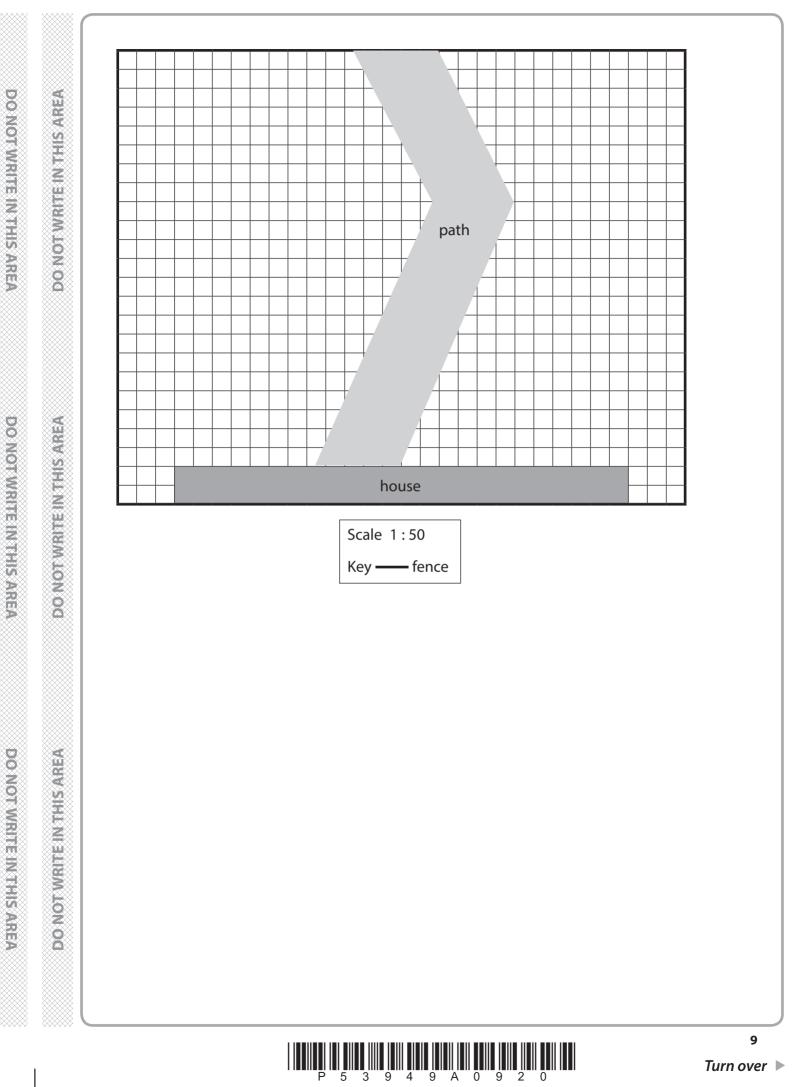Kei makes an accurate plan of the garden using a scale of 1:50

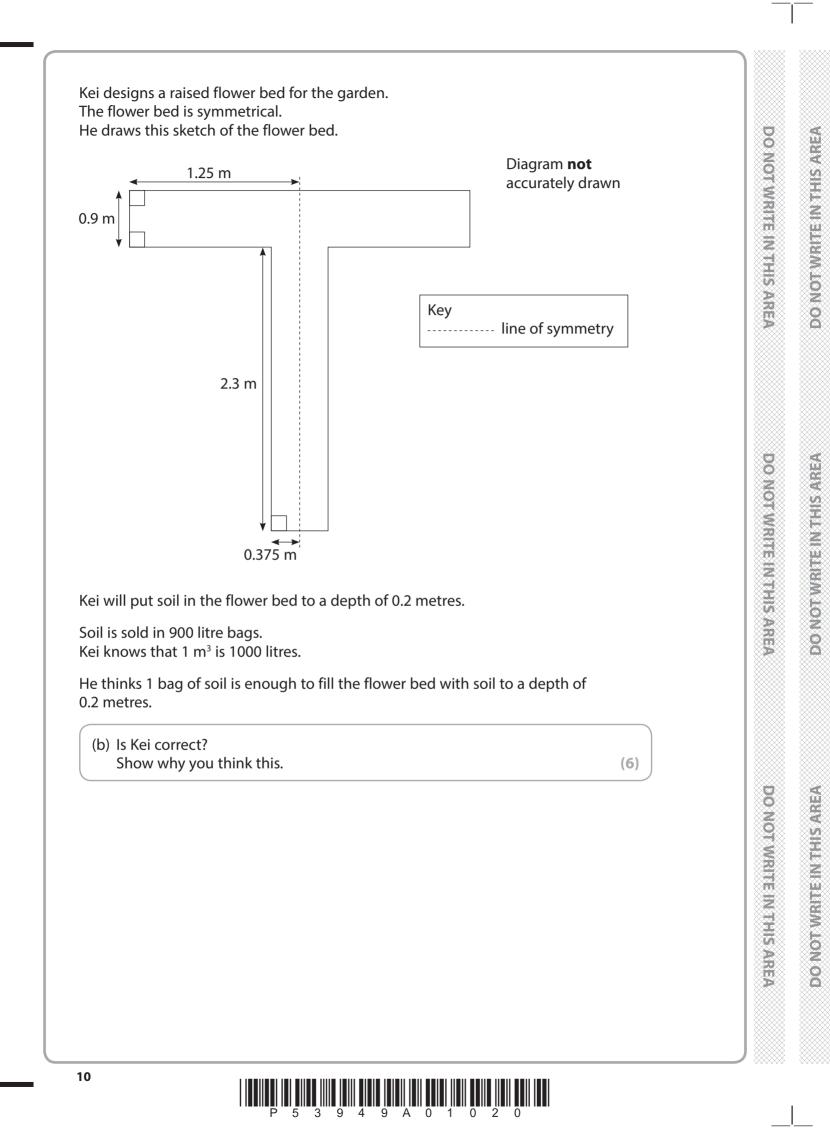(a) Draw a space for the pond on the plan.
Remember to use the scale.

(3)

path

house

Scale 1 : 50

Key ──── fence

Kei designs a raised flower bed for the garden.
The flower bed is symmetrical.
He draws this sketch of the flower bed.

Diagram **not** accurately drawn

1.25 m

0.9 m

2.3 m

0.375 m

Key
-------- line of symmetry

Kei will put soil in the flower bed to a depth of 0.2 metres.

Soil is sold in 900 litre bags.
Kei knows that 1 m^3 is 1000 litres.

He thinks 1 bag of soil is enough to fill the flower bed with soil to a depth of 0.2 metres.

(b) Is Kei correct?
    Show why you think this.

(6)

Use the box below to show clearly how you get your answer.

(Total for Question 5 is 9 marks)

6 Kei completes these jobs for a different client

- turf a total area of 27 m^2
- 3 hours of landscaping
- 1 hour of garden clearance.

Kei uses this price list to work out the total amount his client needs to pay.

	Landscaping	Building	Tree surgery	Garden clearance
First hour	£96	£96	£96	£78
Every additional hour	£33	£43	£43	£33

Area	Pave (per m^2)	Turf (per m^2)
Up to 20 m^2	£15	£12.50
20 m^2 – 30 m^2	£13	£11.50
30 m^2 – 50 m^2	£12	£10

How much in total does the client need to pay Kei for these jobs?
Show a check of your working.
(4)

Use the box below to show clearly how you get your answer.

Use the box below to show your check.

☑

(Total for Question 6 is 4 marks)

P53949A01220

7 Kei has this information about his regular clients.

Postcode	Number of clients by garden area				Total
	Less than 20 m²	**20 m² – 40 m²**	**40 m² – 60 m²**	**60 m² – 100 m²**	
TW15	6	4	8	2	20
KT21	1	6	6	1	14
GU8	0	10	12	0	22

Kei thinks that $\frac{1}{8}$ of all his regular clients have a garden with an area of less than 20 m².

Is he correct?
Show why you think this. **(3)**

Use the box below to show clearly how you get your answer.

(Total for Question 7 is 3 marks)

Answer all questions in this section.

Write your answers in the spaces provided.

8 Tori is a professional diver.

Jane is training Tori in preparation for a diving competition.
She uses these notes to plan a training session for Tori on Monday.

At the gym

Warm up   5-minute walk followed by 3-minute run (repeat 4 times)

Weights $\frac{3}{4}$ hour

Gymnastics 1.5 hours

Trampoline 25 minutes

At the pool

5 m diving board 40 minutes

All times include any breaks Tori needs.
Jane needs to allow 30 minutes for Tori to change and get from the gym to the pool.

The Monday session will start at 4.30 pm.
Jane thinks the session will finish by 9.15 pm.

(a) Will the session finish by 9.15 pm?
Show why you think this.

(4)

Use the box below to show clearly how you get your answer.

On Tuesday morning Tori went running for 40 minutes.

She knows that running for 30 minutes uses 529 kcal.

Tori thinks she used more than 700 kcal by running for 40 minutes.

(b) Is Tori correct?
Show a check of your working.

(4)

Use the box below to show clearly how you get your answer.

Use the box below to show your check.

(Total for Question 8 is 8 marks)

9 Jane has this information about Tori's diving scores in the last 4 competitions.

Competition	1	2	3	4
Preliminary score	498.5	514.0	521.5	519.0
Final score	508.0	517.5	518.0	522.0

Jane works out that the difference between the mean of the preliminary scores and the mean of the final scores is 3.2

(a) Is Jane correct?
Show why you think this.

(3)

Use the box below to show clearly how you get your answer.

Turn over ▶

Tori takes part in another diving competition.
Each diver has six dives.
The diver with the highest total score after their six dives will win.

After five dives Tori has a total score of 428.9

All the other divers in the competition have completed their six dives.
The highest total score so far is 501.7

Tori has one dive left.
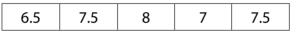The score for each dive is calculated using this formula.

$$T = md$$

T = score for dive
m = sum of 3 middle values from judges' points
d = difficulty tariff

There are five judges who award points for each dive.

The lowest number of points awarded and the highest number of points awarded are removed.
The points that remain are the 3 middle values.

The judges award Tori these points for her last dive.

6.5	7.5	8	7	7.5

Tori's last dive has a difficulty tariff of 3.4

(b) Does Tori win the competition?
   Show why you think this.

(5)

Use the box below to show clearly how you get your answer.

(Total for Question 9 is 8 marks)

TOTAL FOR PAPER IS 48 MARKS

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