

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

GCSE APPLICATIONS OF MATHEMATICS (LINKED PAIR)

H

Higher Tier Unit 1 Finance and Statistics

Friday 4 November 2016

Morning

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



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 that you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80
- The quality of your written communication is specifically assessed in Questions 1 and 17. These questions are indicated with an asterisk (*).
- 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.



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

- 1** The spreadsheet shows some information about the fruit sold in a shop one week.

	A	B	C	D
1	Fruit	Price per kg	Number of kg sold	Income
2	Grapes	£2.36	18.5	
3	Bananas	£1.77	26	
4	Strawberries	£4.80	34	
5				

- 1 (a)** Work out the value in cell D2
Circle your answer.

[1 mark]

£8.93

£20.86

£43.66

£46.02

- 1 (b)** Write a formula for cell D3

[1 mark]

Answer _____

- *1 (c)** Cell D5 is used for the total income.

Write a formula for cell D5

[2 marks]

Answer _____



2 On a UK website a digital map costs £255
On a French website the same map costs 272 euros.

Molly will use a credit card to buy the map.
Her credit card company makes a 3% commission charge on purchases in **euros**.

The exchange rate is £1 = 1.36 euros

How much will Molly save if she uses the French website?
Give your answer in pounds.

[4 marks]

Answer £ _____

Turn over for the next question



3

Sita has some DVDs.

$\frac{1}{4}$ of her DVDs are comedies.

60% of her DVDs are adventure films.

The other 9 DVDs are travel guides.

How many DVDs does Sita have altogether?

You **must** show your working.

[3 marks]

Answer _____



4 Here is an advert for tables from **Tables-4-Now**.

Tables-4-Now
Tables £85 each
+
Delivery £35 (for any number of tables)

4 (a) Write an expression, in £, for the total cost of buying n tables and having them delivered. **[2 marks]**

Answer _____

4 (b) Here is an advert for tables from **Tables Today**.

Tables Today
Tables £87.50 each
+
Delivery £15 (for any number of tables)

James wants to buy some tables and have them delivered to his café.
He finds the total cost is the same from both companies.

How many tables does he want to buy?
You **must** show your working.

[3 marks]

Answer _____

8

Turn over ►



5 Javed's gross salary is £1650 per **month**.

His tax allowance is £10 600 per **year**.

He pays tax at 20% of his taxable income.

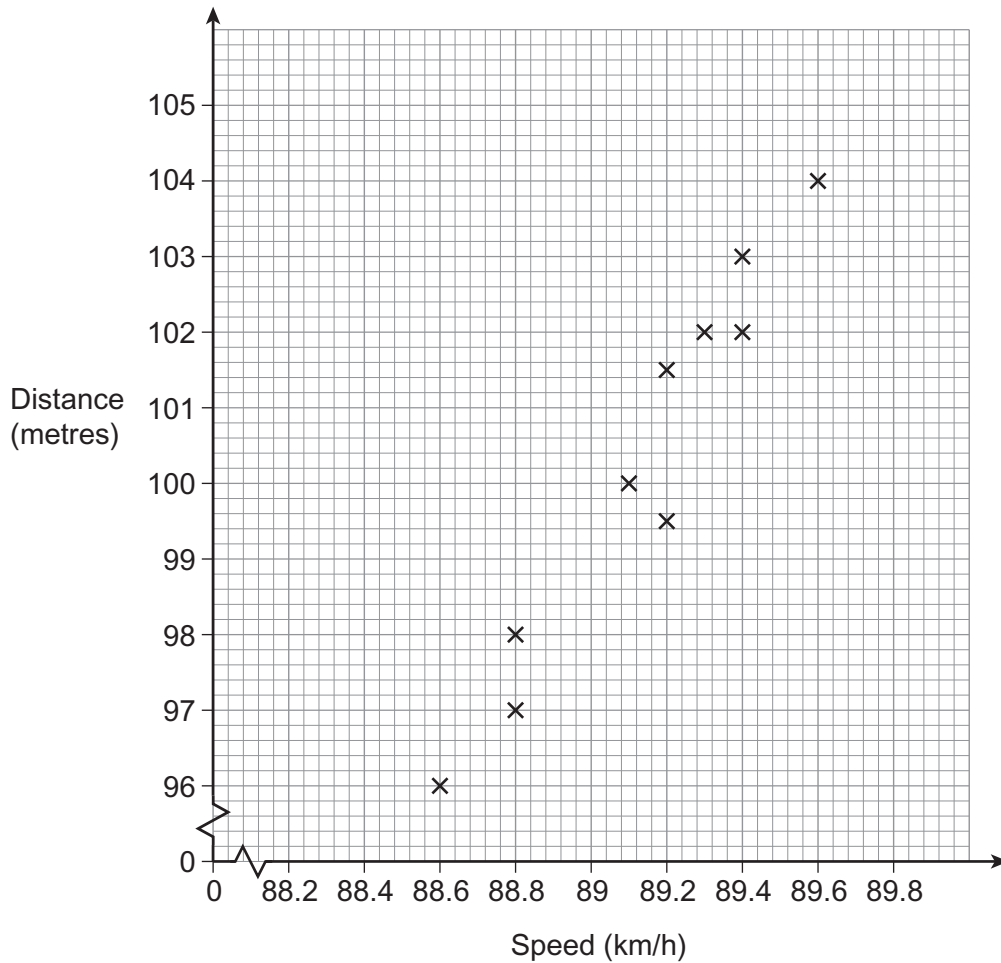
How much tax does Javed pay in a **year**?

[3 marks]

Answer £ _____



6 The scatter diagram shows the take-off speed, in km/h, and the distance jumped, in metres, for ten ski jumpers in a competition.



6 (a) The scatter diagram shows positive correlation.

What does this tell you about the relationship between distance jumped and take-off speed?

[1 mark]

6 (b) Use a line of best fit to estimate the distance jumped for a take-off speed of 89 km/h

[2 marks]

Answer _____ metres

6

Turn over ►



- 7 Phil makes a display using purple flowers, yellow flowers and blue flowers.
the purple flowers and yellow flowers are in the ratio $2 : 5$
and
the purple flowers and blue flowers are in the ratio $3 : 4$
He uses the smallest possible number of flowers for this display.

How many flowers does he use?

[3 marks]

Answer _____



8 Ralph thinks that an ordinary six-sided dice is biased towards the number 6

Describe an experiment that Ralph could do to check if the dice is biased.
Remember to write about,

how the experiment is done

how the results could be used.

[4 marks]

Turn over for the next question

7

Turn over ►



9 Clare is doing a survey about how much television children watch.

9 (a) One of the questions she asks is,

Don't you agree that children watch too much television?

Circle your answer.

Yes

No

Don't know

Write down **one** criticism of this question.

[1 mark]

9 (b) Write a suitable question to find out how much television children watch.
Include a response section.

[2 marks]



9 (c) The table shows the number of students in each year group of an upper school. There are 400 students in total.

Year 9	Year 10	Year 11
101	142	157

The teacher wants a sample of 50 students, stratified by year group.

Work out the number of students she should choose from each year group.

[2 marks]

Answer Year 9 _____

Year 10 _____

Year 11 _____

Turn over for the next question

5

Turn over ►



10

Mia wants to take out car insurance.

An insurance company looks at the risk of her having an accident.

They work out these probabilities.

$$P(\text{She will have an accident and need her car replacing}) = 0.05$$

$$P(\text{She will have an accident and need her car repairing}) = 0.12$$

The insurance company estimates it will cost,

£12 000 to replace her car

£3000 to repair her car.

Work out the minimum amount the company should charge Mia for her car insurance.

[3 marks]

Answer £ _____



11 Jack and Alice are buying school uniform.

Jack buys 5 shirts and 2 jumpers for £30.95

Alice buys 3 shirts and 1 jumper for £17.47

Work out the cost of a shirt and the cost of a jumper.

[4 marks]

Answer Shirt £ _____

 Jumper £ _____

Turn over for the next question

7

Turn over ►



12

Paul moves a pile of logs to his log store using a plastic garden sack.

He makes 25 trips with a mean load of 13 logs.

He makes another 80 trips with a mean load of 9 logs.

If his mean load was 11 logs each time, how many fewer trips would he have made?

You **must** show your working.

[4 marks]

Answer _____



13 In July 2015 the population of the UK was estimated to be 6.46×10^7

13 (a) The total land area of the UK is 2.44×10^5 square kilometres.

What was the average number of people per square kilometre in the UK in July 2015?

[2 marks]

Answer _____

13 (b) The population of the UK is estimated to increase by 0.54% per year.

Use this information to estimate the population of the UK in July 2017
Give your answer in standard form, correct to 3 significant figures.

[4 marks]

Answer _____



- 14** The table shows Carl's quarterly gas bills for 2015 and the first 3 quarters of 2016. Some of the four-point moving averages are also shown.

	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016
Amount (£)	190	82	138	182	206	90	154
Four point moving average (£)			148	152	154		

- 14 (a)** Work out the fourth four-point moving average.

[2 marks]

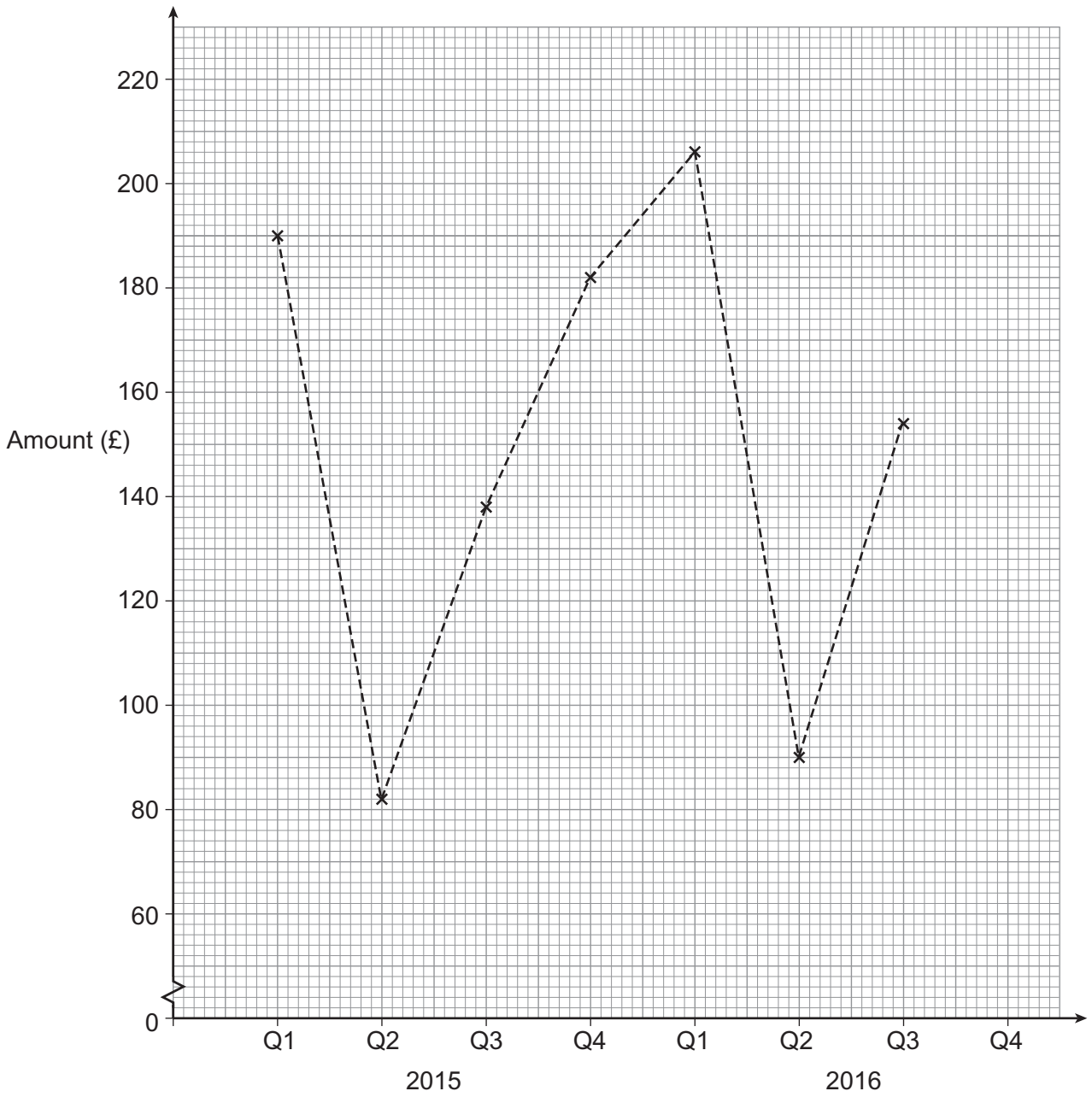
Answer £ _____

- 14 (b)** The time series graph opposite shows the amount of each bill.

Plot all the moving point averages on the graph.

[2 marks]





14 (c) Use a trend line to estimate Carl's bill in quarter 4 of 2016

[3 marks]

Answer £ _____

7

Turn over ►

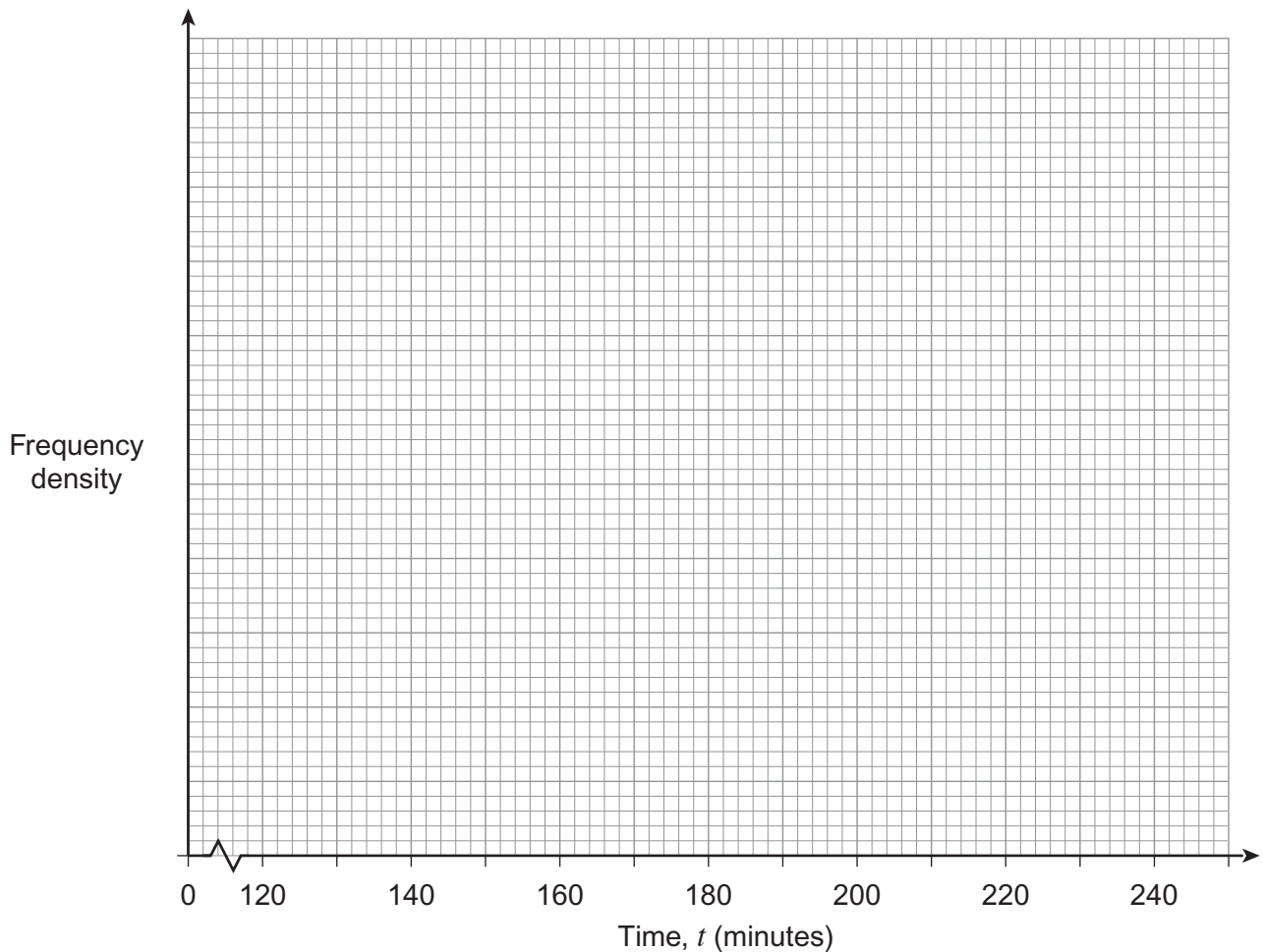


- 15 The table shows information about the time, t (minutes), 100 people take to complete a cycle ride.

Time, t (minutes)	Frequency
$120 < t \leq 130$	12
$130 < t \leq 140$	20
$140 < t \leq 160$	30
$160 < t \leq 180$	20
$180 < t \leq 240$	18

- 15 (a) Draw a histogram to represent this information.

[3 marks]



- 15 (b)** Estimate the number of people who completed the cycle ride in 146 minutes or less.
You **must** show your working.

[3 marks]

Answer _____

Turn over for the next question

6

Turn over ►



- 16** The population of Kendal is 28 000 to the nearest thousand.
On average, each person in the town uses 130 litres, to the nearest 10 litres,
of water each day.

Work out an estimate of the upper limit for the amount of water used each day in total
for the population of Kendal.

You **must** show your working.

[4 marks]

Answer _____ litres



***17**There are x beads in a jar. $\frac{2}{5}$ of these beads are red.

Another 15 red beads are put in the jar.

Now, $\frac{3}{7}$ of the beads in the jar are red.Use an algebraic method to work out the value of x .**[5 marks]**

Answer _____

Turn over for the next question

18 Jan makes and sells two sizes of bag.
She uses the same cloth for each size of bag.

A large bag needs 0.5 m^2 of cloth.
A small bag needs 0.25 m^2 of cloth.

Jan has 8 m^2 of cloth to use.

Let x be the number of large bags.
Let y be the number of small bags.

18 (a) Use this information to show that $2x + y \leq 32$

[1 mark]

Jan wants to make at least 5 bags of each size.

18 (b) Use the grid opposite to show the region that represents **all** the information.

[3 marks]

18 (c) She makes,
£6 profit on each large bag she sells
£3.50 profit on each small bag she sells.

Use your graph to work out the number of each size of bag she needs to sell to make the maximum profit, and state this profit.

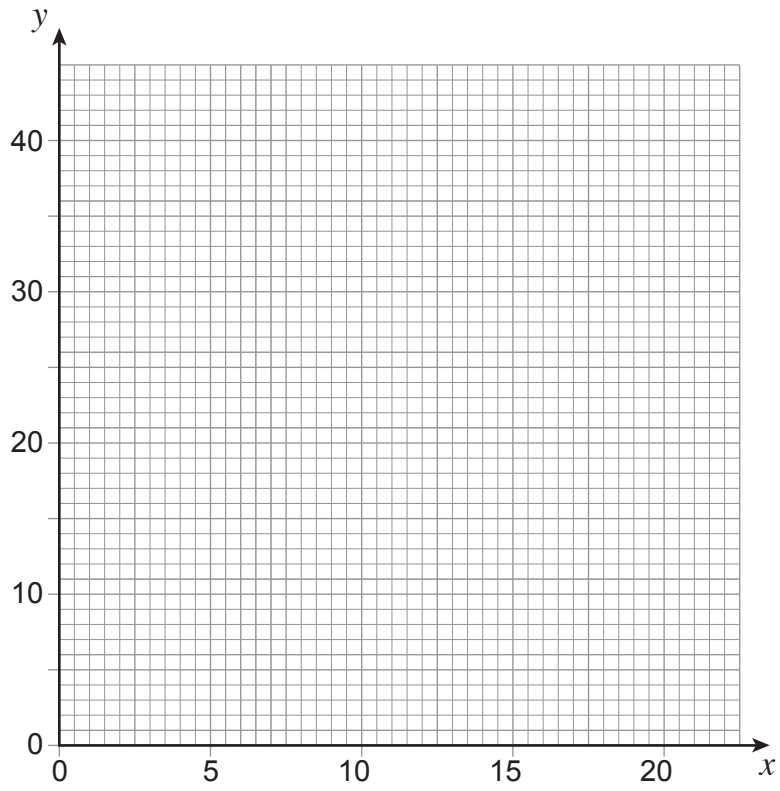
[3 marks]

Number of large bags _____

Number of small bags _____

Profit £ _____





END OF QUESTIONS



There are no questions printed on this page

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