AQA

Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
APPLICATIONS OF MATHEMATICS (LINKED PAIR)

H

Higher Tier Unit 1 Finance and Statistics

Thursday 9 June 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 you do not want to be marked.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

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 9 and 12. These questions are indicated with an asterisk (*).
- You may ask for more answer paper, tracing paper and graph paper. These must be tagged securely to this answer book.

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

Do not write outside the box

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

1 A bus travels from Newcastle to Manchester.
The bus stops at some places on the route.

The driver keeps a record of how many people are on the bus when it **leaves** each place.

	Number of people on the bus
Leaving Newcastle	35
Leaving Durham	50
Leaving Harrogate	52
Leaving Leeds	
Arrive Manchester	

1 (a) At Durham, 3 people get off the bus.

How many people get on the bus at Durham?

[1 mark]

Answer _____

1 (b) At Leeds,

28 people get off the bus

6 people get on the bus.

How many people are on the bus when it leaves Leeds?

[2 marks]

Answer _____

Do not write outside the box

2 Andy pays £3500 to buy a car that needs repairing.

He spends £750 repairing the car.

He sells the car for 65% more than the £3500 he paid.

Work out his profit.

[3 marks]

Answer £ _____

3 Five children are each asked 10 questions.

One mark is given for each correct answer.

Each child scores 7 or more marks.

Only one child scores 10 marks.

The mean of their five scores is one mark higher than the median of their five scores.

Work out the other four scores.

[2 marks]

Answer _____

8

Do not write outside the box

4 A golf club has 580 members.

Here is some information about their age and gender.

75 of the members are men aged 25 to 39

250 members are aged 60 or over.

15% of the members are women aged 40 to 59

In the under 25 age group the ratio of men to women is 2 : 1

Some other information is shown in the two-way table.

	Under 25	**25 to 39**	**40 to 59**	**60 or over**	**Total**
Men					
Women		35			230
Total	33				580

Complete the table.

[5 marks]

Do not write outside the box

5 Every morning Emma cycles the same distance.

One morning she stops for a rest when she has cycled exactly half the distance.

After a **further** 5 km she has cycled exactly $\frac{2}{3}$ of the total distance.

How many kilometres does Emma cycle each morning?
You **must** show your working.

[3 marks]

Answer _____ km

Turn over for the next question

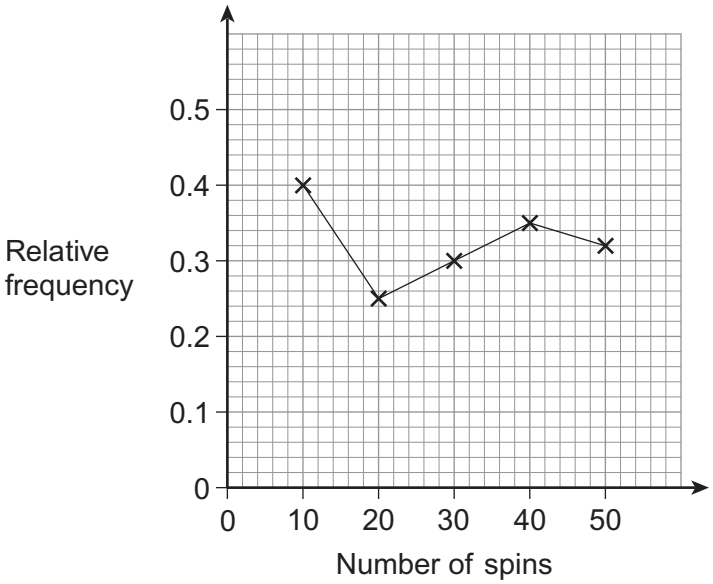
8

Do not write outside the box

6 A spinner has coloured sections.

Ellie spins the spinner 50 times.

After every 10 spins she records the total number of times the spinner has landed on blue.
The graph shows the relative frequency of blue after every set of 10 spins.



6 (a) How many times did the spinner land on blue in the first 30 spins?

[2 marks]

Answer _____

6 (b) Ellie continues to spin the spinner.
In total she spins it 200 times.

What is the best estimate for the number of times Ellie should expect the spinner to land on blue?
You **must** show your working

[2 marks]

Answer _____

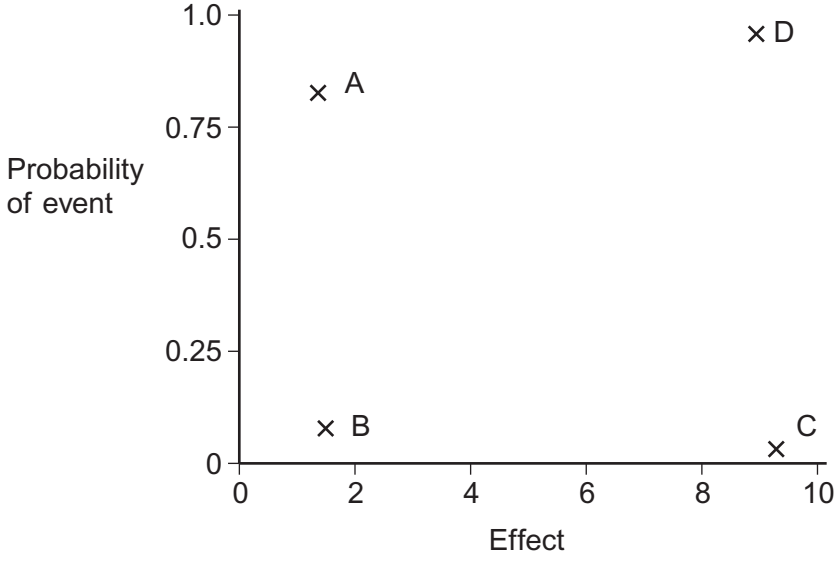
Do not write outside the box

7 Here is a risk diagram.
The horizontal scale measures the effect of an event on a scale of 0 to 10

0 means no serious effect

10 means a very serious effect

The vertical scale shows the probability of an event happening.



Two events are described.

Event 1 A tree falls on someone.

Event 2 Someone has to queue to pay at a supermarket when the store is very busy.

7 (a) Which point on the diagram best matches **Event 1**?
Circle your answer.

[1 mark]

A B C D

7 (b) Which point on the diagram best matches **Event 2**?
Circle your answer.

[1 mark]

A B C D

6

Do not write outside the box

8 A bank gives 3% compound interest per year on an investment.
Tariq invests £1750 for 4 years.

Work out the total value of his investment after 4 years.

[3 marks]

Answer £ _____

Do not write outside the box

***9 (a)** Sita is 158 cm tall.

Teri is 164 cm tall.

Helen is h cm tall.

Helen is taller than Sita but **not** taller than Teri.

Use **all** the information above to write down an inequality in h about Helen's height.

[2 marks]

Answer _____

***9 (b)** Sita is x years old.

Teri is 3 years older than Sita.

Helen is 2 years younger than Sita.

The total of their ages is 43 years.

Set up and solve an equation to work out their ages.

[5 marks]

Sita _____ years old

Teri _____ years old

Helen _____ years old

10

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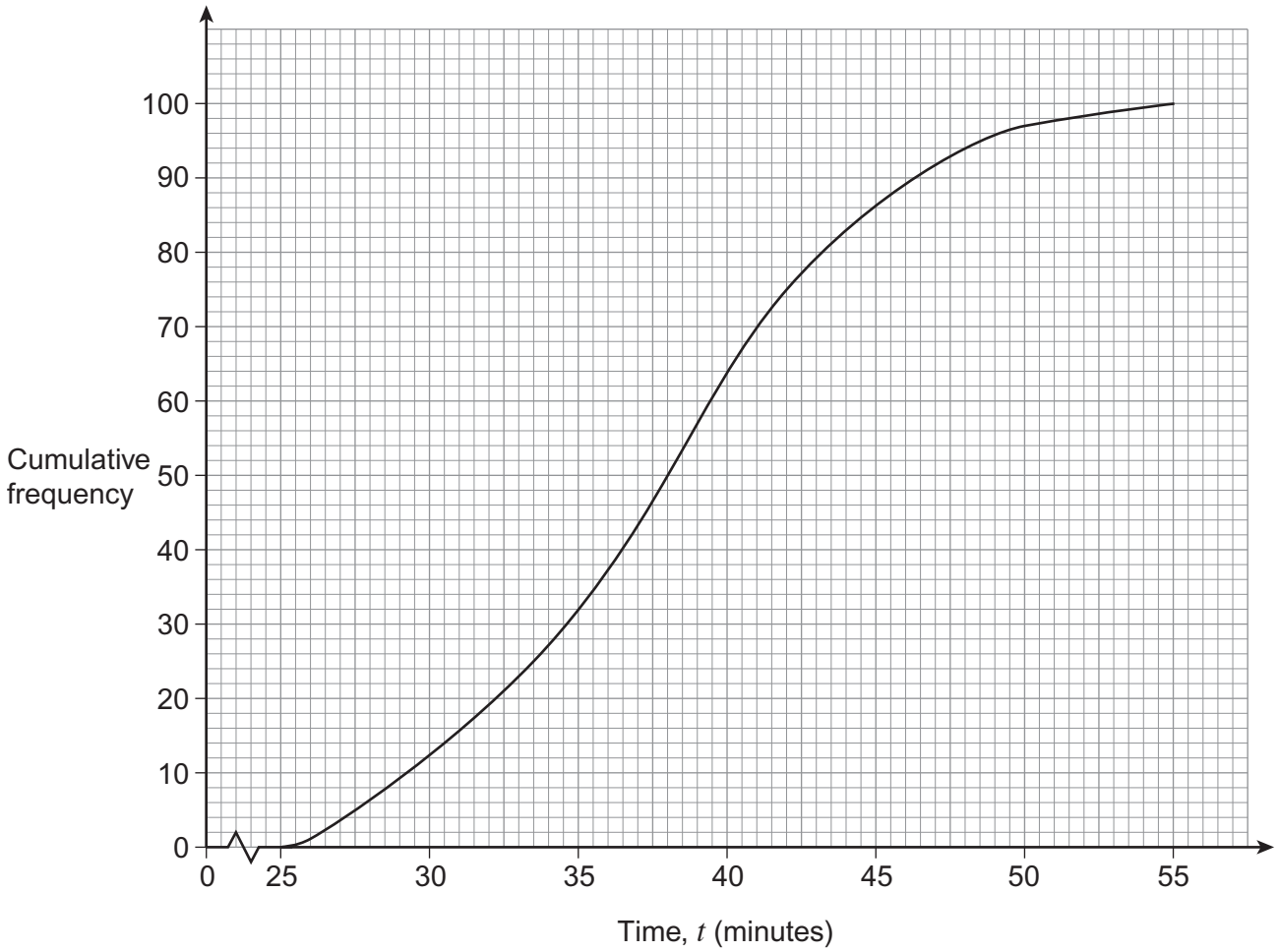
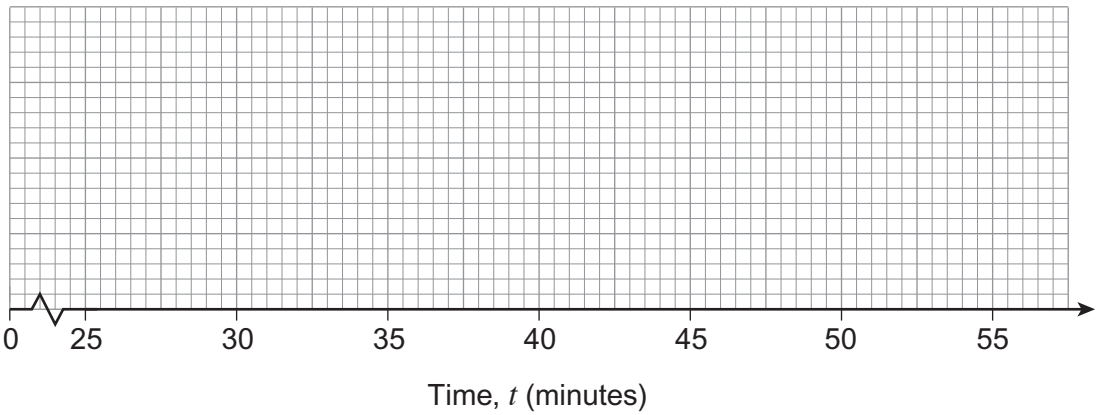
10 The cumulative frequency diagram shows information about the finishing times of 100 runners in a race in 2015



The fastest runner finished in 26 minutes.
The slowest runner finished in 54 minutes.

10 (a) Use this information and the cumulative frequency diagram to draw a box-and-whisker plot for these runners.

[3 marks]



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10 (b) The table shows information about the finishing times of the runners in the same race in 2014

Fastest time	27 minutes
Lower quartile	32 minutes
Median	39 minutes
Upper quartile	45 minutes
Slowest time	54 minutes

Eli says,

"Times were faster on average and more consistent in 2014 than in 2015"

Comment on Eli's statement.
You **must** support your comments with working.

[4 marks]

7

Do not write outside the box

11 An athletics club meets on Tuesday, Wednesday and Friday each week.
The table shows how many people went to the athletics club each day for two weeks.

One of the values in the table is missing.

Week 1			Week 2		
Tuesday	Wednesday	Friday	Tuesday	Wednesday	Friday
56	62	44	59		48

11 (a) Work out the **first** three-point moving average.

[2 marks]

Answer _____

11 (b) The **third** three-point moving average is 57

Calculate how many people went to the athletics club on Wednesday of Week 2

[3 marks]

Answer _____

Do not write outside the box

12 The table shows information about visitors to three National Parks.

National Park	Number of visitors in 2015	Amount spent by visitors in 2015 (£)
Norfolk Broads	8×10^6	5.68×10^8
Exmoor	1.4×10^6	8.5×10^7
Northumberland	1.5×10^6	1.9×10^8

12 (a) Work out the total amount spent by visitors in 2015 at these National Parks.
Give your answer in standard form.

[2 marks]

Answer £ _____

***12 (b)** A visitor reads the information given in the table and says,

"On average, visitors to Northumberland spend more than twice as much, per person, as visitors to Exmoor."

Is the visitor correct?
You **must** show your working.

[4 marks]

11

Do not write outside the box

13 The cost of a packet of tea is $\frac{4}{7}$ of the cost of a jar of coffee.

10 jars of coffee and 6 packets of tea cost £20.68

Work out the cost of a packet of tea.
You **must** show your working.

[5 marks]

Answer _____

Do not write outside the box

14 A helicopter can take 6 passengers.
The total mass of the passengers must not be more than 1245 pounds.

Five passengers are already booked on a helicopter trip.

Their total mass is 1065 pounds, correct to the nearest 5 pounds.

Kate has a mass of 179 pounds, correct to the nearest pound.

Can she definitely be the sixth passenger on this helicopter trip?
You **must** show your working.

[4 marks]

Turn over for the next question

9

Do not write outside the box

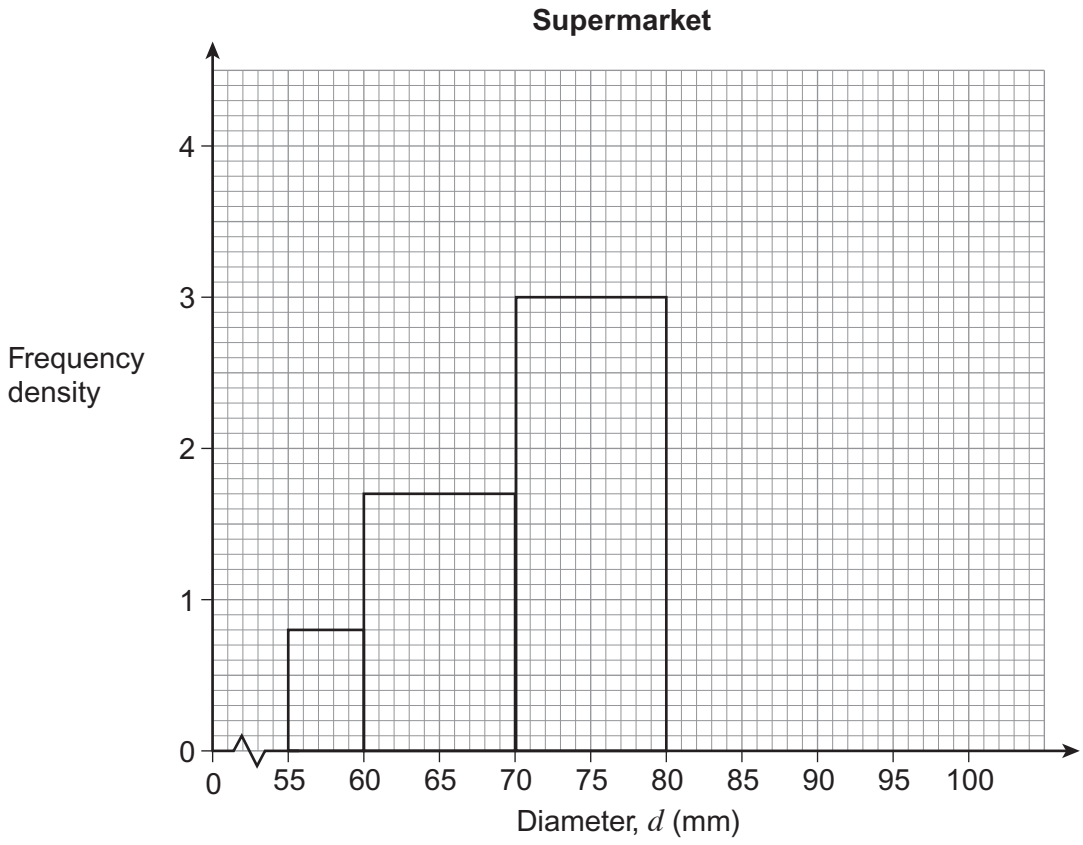
15 A sample of 75 oranges is taken from a supermarket.

The diameter of each orange is measured.

Diameter, d (mm)	Frequency
$55 < d \leqslant 60$	4
$60 < d \leqslant 70$	17
$70 < d \leqslant 80$	30
$80 < d \leqslant 85$	18
$85 < d \leqslant 100$	6

15 (a) Complete the histogram to show this information.

[2 marks]



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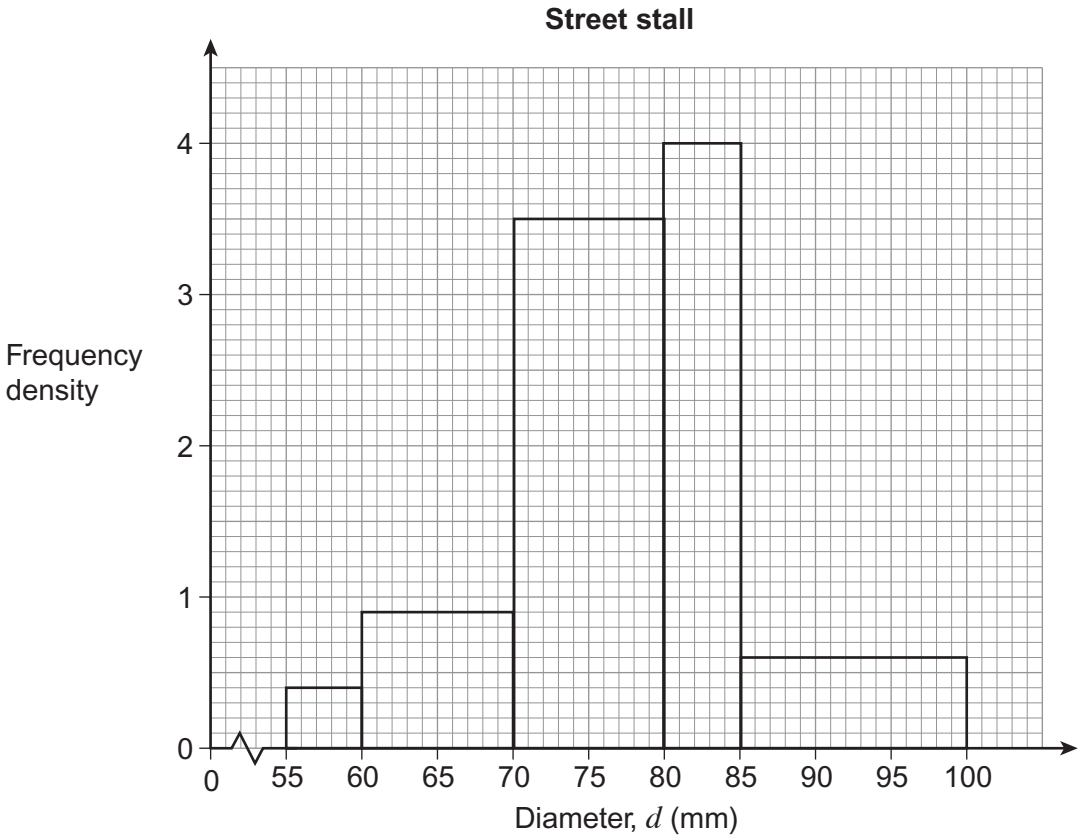
15 (b) This histogram shows information about the diameters of a sample of 75 oranges from a street stall.



Large oranges have diameters over 78 mm

Estimate how many **more** large oranges there are in the street stall sample than in the supermarket sample.
You **must** show your working.

[5 marks]

Answer _____

7

Turn over ▶

Do not write outside the box

16 A shopkeeper is going to sell dishwasher tablets.

He decides to order two types of tablet, Dazzle and Supreme.

He wants to order at least twice as many boxes of Dazzle as Supreme.

16 (a) An inequality for this information is $d \geqslant 2s$

Explain what the letters d and s represent.

[1 mark]

16 (b) The shopkeeper will order no more than 20 boxes of tablets.

Use this information to write down another inequality for d and s.

[1 mark]

16 (c) Use the grid opposite to show the region that represents all the information.

[3 marks]

16 (d) The shopkeeper makes a profit of

80p on each box of Dazzle sold

£1.10 on each box of Supreme sold.

Use your graph to work out the number of boxes of each type of dishwasher tablet he should order to make the maximum profit.

Work out the maximum profit.

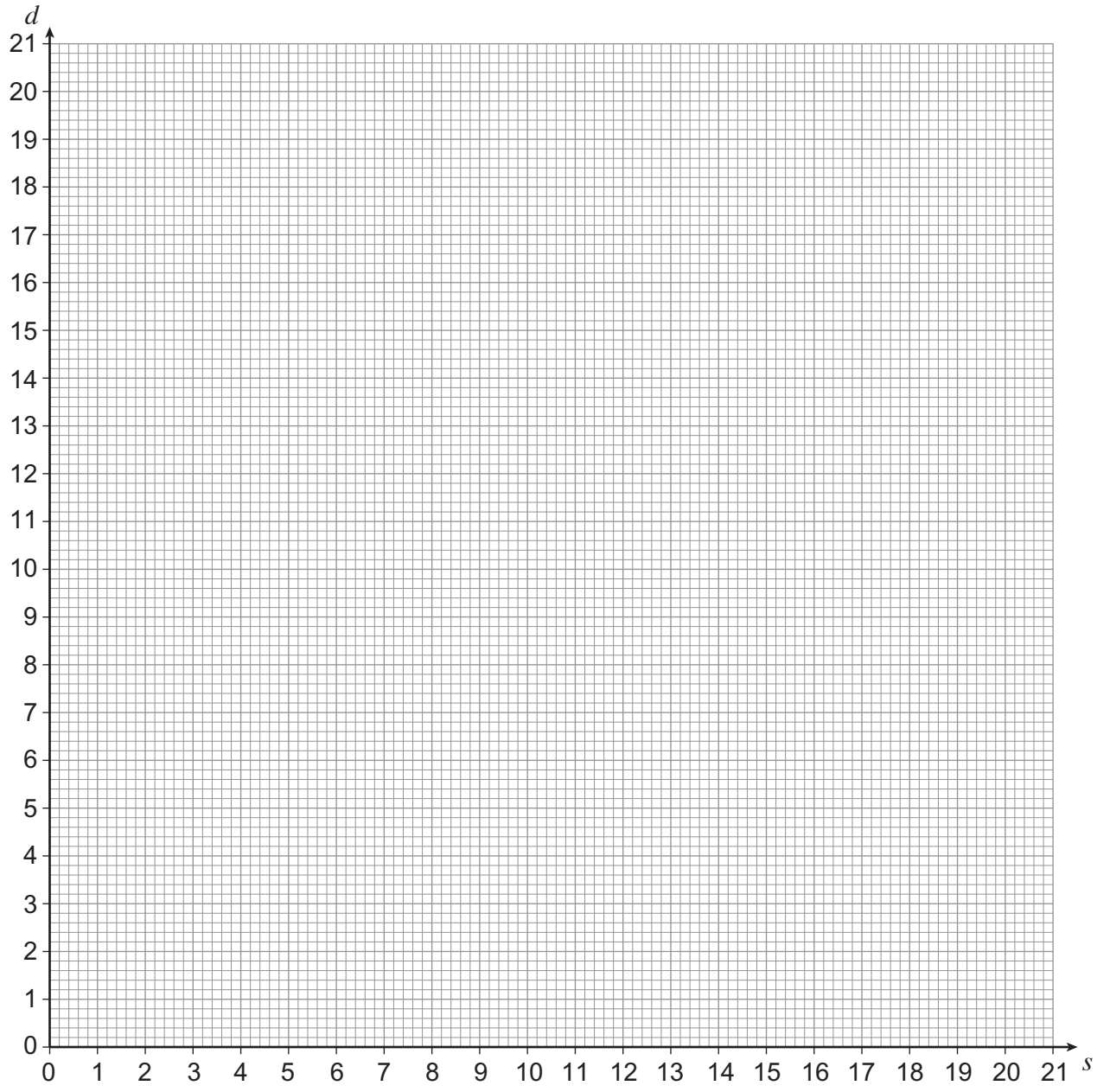
[3 marks]

Supreme _____

Dazzle _____

Maximum profit £ _____

Do not write outside the box



Turn over for the next question

8

Do not write outside the box

17 When you buy a house for more than £125 000 you have to pay a tax called stamp duty.

For houses costing up to £925 000, you pay

nothing on the first £125 000 of the property price

2% on the next £125 000 of the property price

5% on any portion of the property price above £250 000

Tom wants to buy a house.
The most Tom can afford to spend on the property, including stamp duty, is £315 500

Work out the highest property price he can afford.
You **must** show your working.

[6 marks]

Answer £ _____

END OF QUESTIONS

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