



Please write clearly in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

I declare this is my own work.

GCSE STATISTICS

H

Higher Tier Paper 1

Monday 2 June 2025

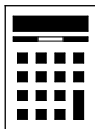
Morning

Time allowed: 1 hour 45 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.
- Fill in the boxes at the top of this page.
- 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.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross out any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

For Examiner's Use	
Question	Mark
1–4	
5	
6	
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8	
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10	
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14	
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17	
18	
TOTAL	



J U N 2 5 8 3 8 2 1 H 0 1

IB/M/Jun25/G4005/V10

8382/1H

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

1 Chris is investigating the ages of people in his town.

He says,

“I can collect data about the ages of people at my school to produce a fair sample.”

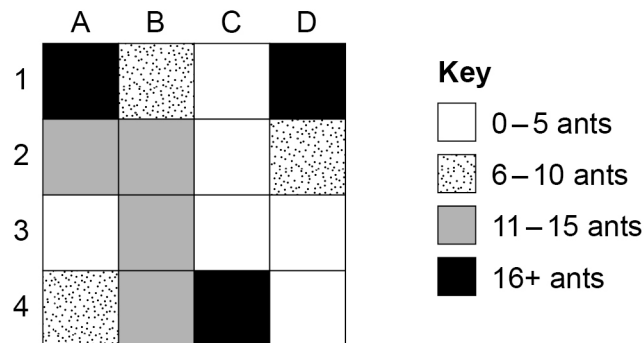
Explain why Chris **may** be wrong.

[1 mark]

2 The choropleth map shows information about the number of ants seen in a garden.

The only ants' nest in the garden is in C4.

The only food source is in A1.



Adam says,

“Cell D1 is wrong.”

Give **one** reason why Adam may be correct.

[1 mark]



- 3 The table shows information about vehicles for sale on a website.

	Diesel	Petrol	Electric	Total
Car	24	150	126	300
Van	48	5	1	54
Total	72	155	127	354

A vehicle is chosen at random.

Write down the probability that it is a **diesel car**.

[1 mark]

Answer _____

- 4 Luca wants to measure the water quality in a large lake.
He takes 250 samples from the north end of the lake.
Write down **one** improvement Luca could make to his method.

[1 mark]

4

Turn over for the next question

Turn over ►



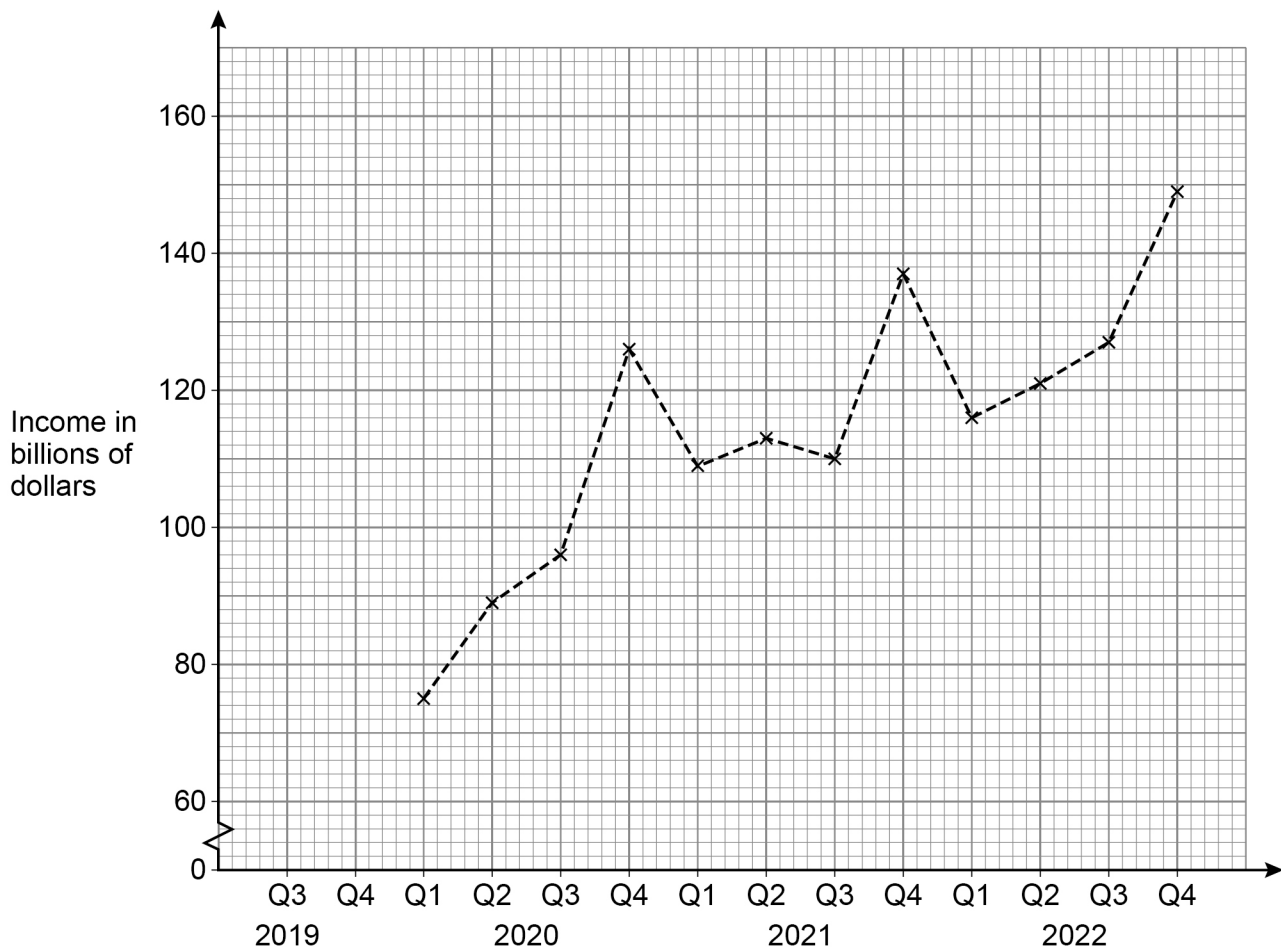
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- 5** The time series graph shows Amazon's quarterly income in billions of dollars.



Source – adapted from www.macrotrends.net

- 5 (a)** Make **two** comments about the patterns in the data.

[2 marks]

Comment 1 _____

Comment 2 _____

Question 5 continues on the next page



5 (b) This table shows the data used to draw the time series graph.

It also shows some of the 4-point moving averages.

Year	Quarter	Income in billions of dollars	4-point moving average (nearest billion)
2019	4		
2020	1	75	
	2	89	87
	3	96	97
	4	126	105
			111
2021	1	109	115
	2	113	117
	3	110	119
	4	137	121
			125
2022	1	116	
	2	121	
	3	127	
	4	149	

Source – adapted from www.macrotrends.net

5 (b) (i) Calculate the missing 4-point moving average.

Round your answer to the nearest billion.

[3 marks]

Answer _____ billion dollars



5 (b) (ii) Bob says,

“The Quarter 4 income for 2019 is greater than 97 billion dollars.”

Is Bob correct?

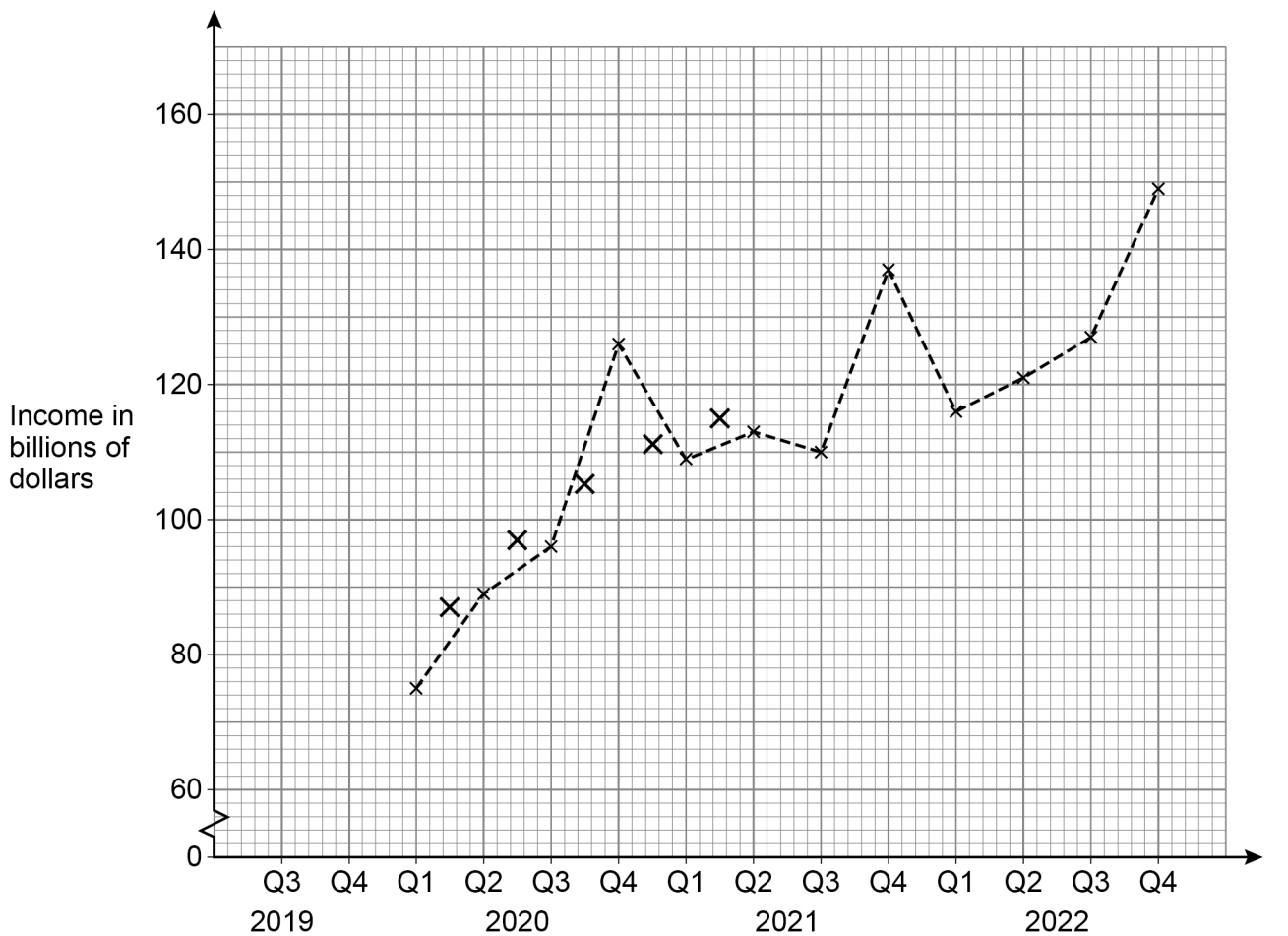
Show working to support your answer.

[2 marks]

5 (c) Here is the time series graph again showing the first five 4-point moving averages.

Plot the **five** remaining 4-point moving averages from part (b) and draw the trend line.

[3 marks]



Source – adapted from www.macrotrends.net



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6 (a) Chia works at a call centre.

Here are the waiting times, to the nearest minute, for the last 11 calls she answered.

3 4 5 5 5 6 7 9 13 15 16

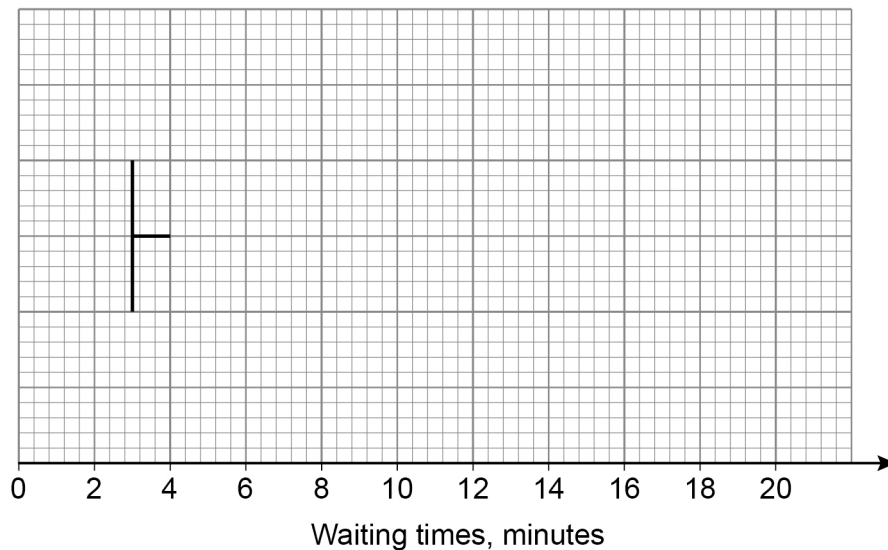
Chia has started to draw a box plot for these waiting times.

Complete the box plot.

You may use the table to help.

[4 marks]

Lower quartile	
Median	
Upper quartile	



Question 6 continues on the next page

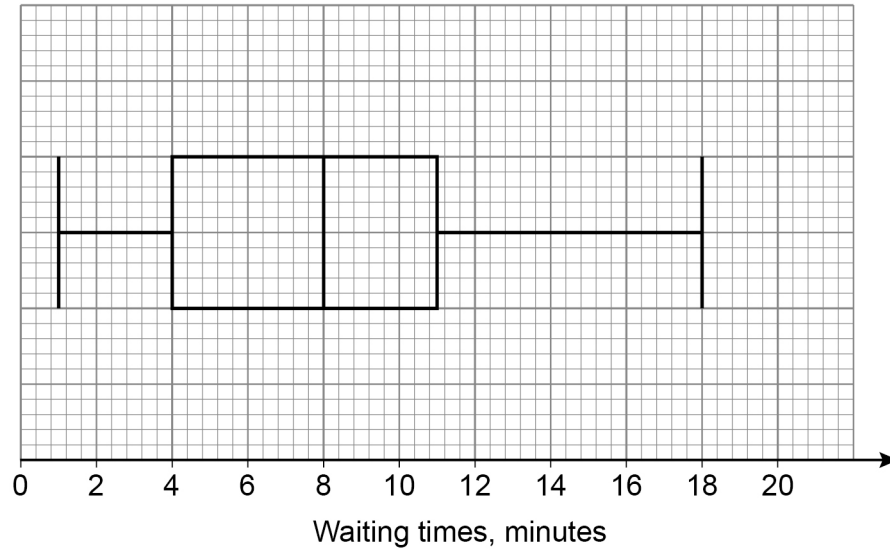
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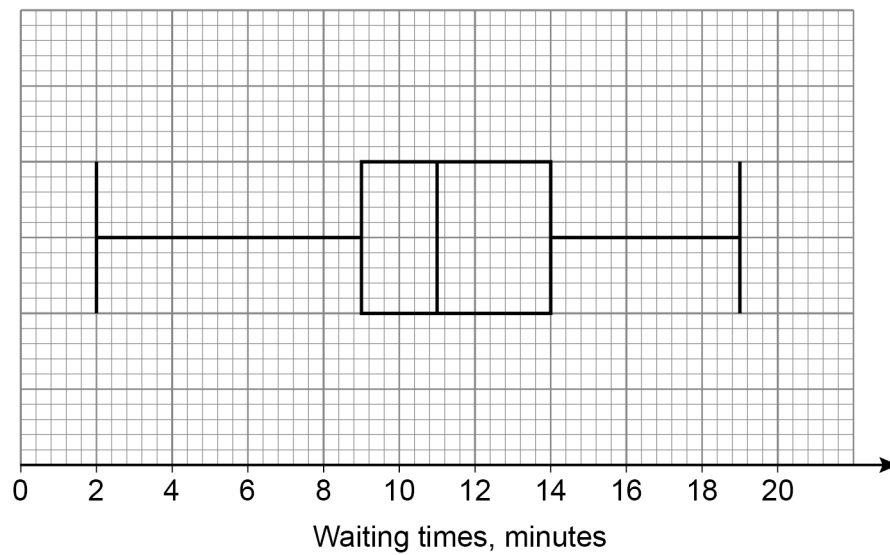
- 6 (b)** Chia is investigating the waiting times on different days.

Here are the box plots for the waiting times on a Monday and a Friday.

Monday



Friday



Compare statistically the average waiting time and the consistency of the waiting times on this Monday and this Friday.

[3 marks]

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7

Turn over for the next question

Turn over ►



- 7** Here are data about the number of cars waiting at a road junction each day for two months.

The data for December are shown in the back-to-back stem and leaf diagram.

May											December									
										2	0	6	7	8	9					
										3	1	2	2	4	5	6	7	7	9	
										4	0	2	3	6	7					
										5	1	2	5	9						
										6	0	1	2	4						
										7	0	4	5							
										8	6									

Key 3 | 4 | 7 represents 43 cars on a day in May and 47 cars on a day in December

- 7 (a)** The number of cars on each day in May are

21	69	44	77	54	67	52	35	61
86	31	41	74	50	80	36	63	59
48	72	57	56	32	45	67	58	68
57	20	49	46					

Complete the back-to-back stem and leaf diagram to show the data for May.

[3 marks]



- 7 (b)** Without completing a calculation, compare the average number of cars waiting at the junction each day in May and December.

[1 mark]

4

Turn over for the next question

Turn over ►



8

The statements below show information about the risk of developing a skin condition.

The risk is
59% greater
for people who
have used a
sunbed.

Andi

The risk is
greater if you
frequently use
perfumed body
lotion.

Kav

The risk for
people born in
1961 is 2% for
females and
3% for males.

Frankie

Give **three** reasons why the statements may not be helpful for someone trying to estimate their risk of developing the skin condition.

[3 marks]

1 _____

2 _____

3 _____

3



Alex rolls a red dice and a blue dice.

- Alex scores six on **both** dice 11 times.

“This shows that the blue dice is fair.”

Show working to support your answer.

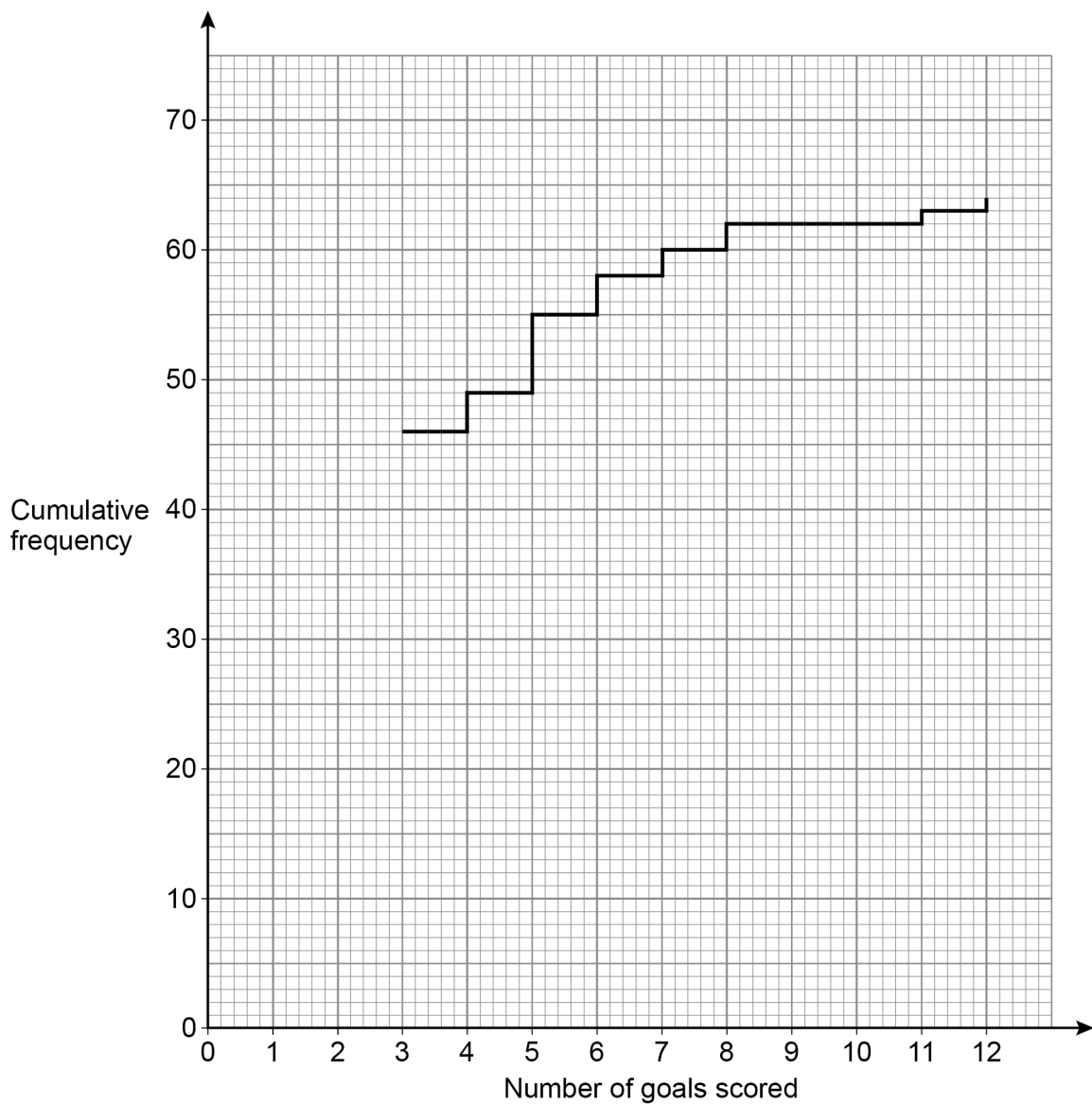
This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on its right side, suggesting it's resting on a surface.

3

10

Harriet is investigating the number of goals scored in each game of the 2022 football World Cup.

The cumulative frequency step polygon shows some of the information.



Source: adapted from www.fifa.com

10 (a) There were,

- 6 games where 0 goals were scored
- 10 games where 1 goal was scored
- 15 games where 2 goals were scored.

Use this information to complete the graph.

[3 marks]



10 (b) Harriet says

“At least 20% of the games played had 5 or more goals scored.”

Is Harriet correct?

Tick (✓) a box.

Yes

☐

No

☐

Show working to support your answer.

[3 marks]

10 (c) Harriet went to 5 of the games.

2 of the 64 games are chosen at random.

Calculate the probability that Harriet went to **both** of these games.

[2 marks]

Answer _____

8

Turn over for the next question

Turn over ►



- 11** The table shows index numbers for the average price of diesel in parts of the UK.

The base month is December 2021.

	December 2021	June 2022	December 2022	June 2023
Northern Ireland	100	121.2	125.4	98.1
Wales	100	121.7	126.7	101.9
Scotland	100	120.1	124.8	100.6

- 11 (a)** Between which **two** months was the greatest change seen in **Northern Ireland**?

Give a reason for your answer.

[1 mark]

Answer _____ and _____



11 (b) The average price of diesel in Somerset was,

- 150.4p per litre in December 2021
- 153.7p per litre in June 2023

A newspaper claims that the price of diesel in **Wales** increased by a greater percentage than in Somerset between December 2021 and June 2023.

Is the claim correct?

Show calculations to support your answer.

[3 marks]

4

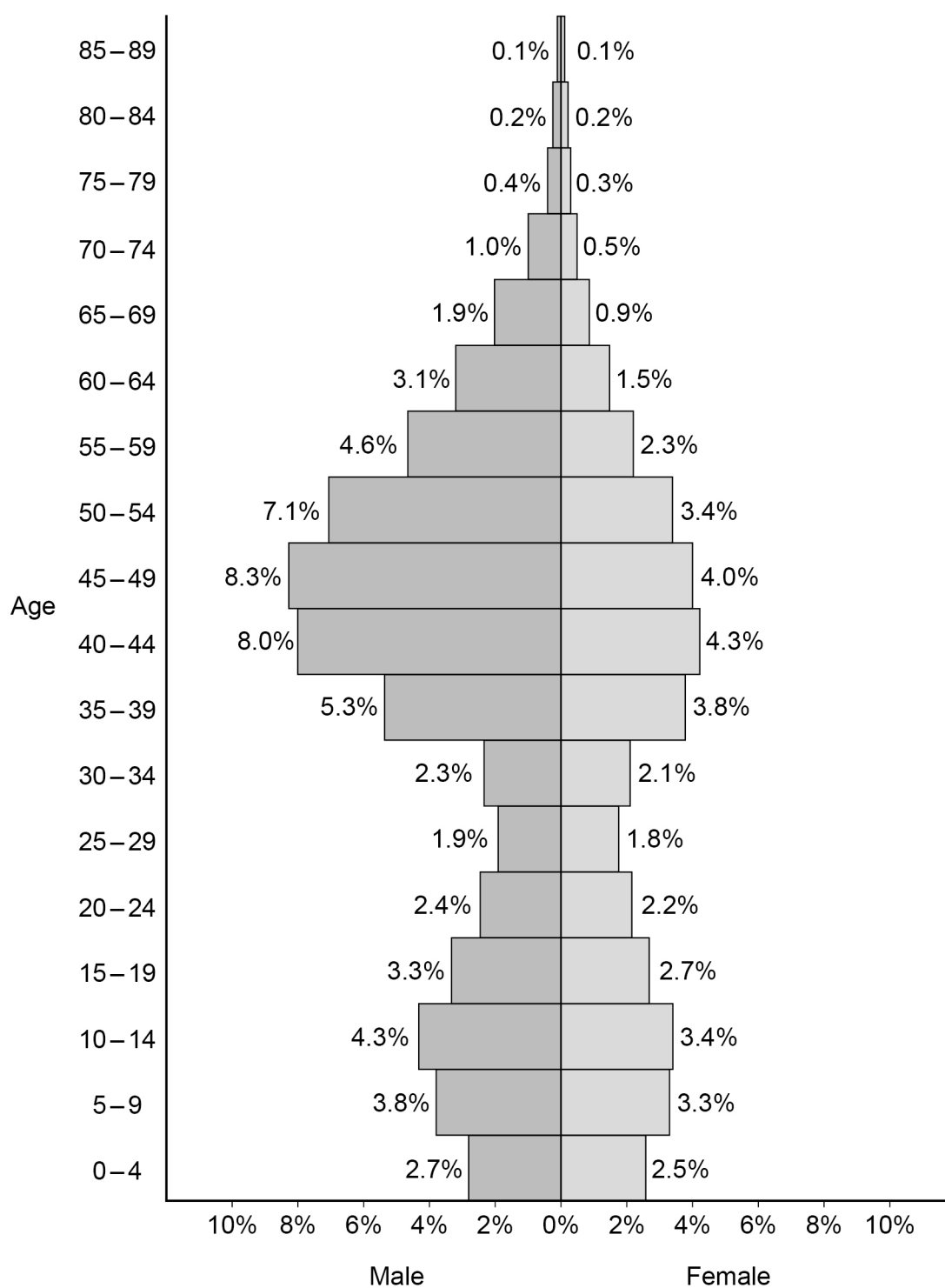
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12

The population pyramid shows information about the population of Kuwait in 2023.



Kuwait, 2023
Population: 4 310 107

Source – adapted from populationpyramid.net



12 (a) Bailey says,

“To get a representative sample, we will have to stratify by age and gender.”

Explain **one** way that the population pyramid supports this statement.

[1 mark]

12 (b) Bailey takes a stratified sample from the population of 4 310 107

There are 4200 males in the sample aged between 40 and 59 years old.

Calculate the **total** number of people in the sample.

[3 marks]

Answer _____

Question 12 continues on the next page

Turn over ►



- 12 (c)** The table shows information about the whole population of Kuwait.

Age, a (years)	Percentage of population
$a \leq 19$	26
$a \leq 39$	47.8
$a \leq 59$	89.8
$a \leq 79$	99.4
$a \leq 89$	100

Bailey says,

“The difference between the 10th and 90th percentiles **must** be more than 40 years.”

Is Bailey correct?

Tick (✓) a box.

Yes

☐

No

☐

Give a reason for your answer.

[1 mark]



13

Diego wants to estimate the number of butterflies in a forest.

He catches 189 butterflies, marks their wings and safely releases them.

10 days later, he catches 80 butterflies.

54 of these butterflies have marks on their wings.

Calculate an estimate for the total number of butterflies in the forest.

[3 marks]

Answer _____

3

Turn over for the next question

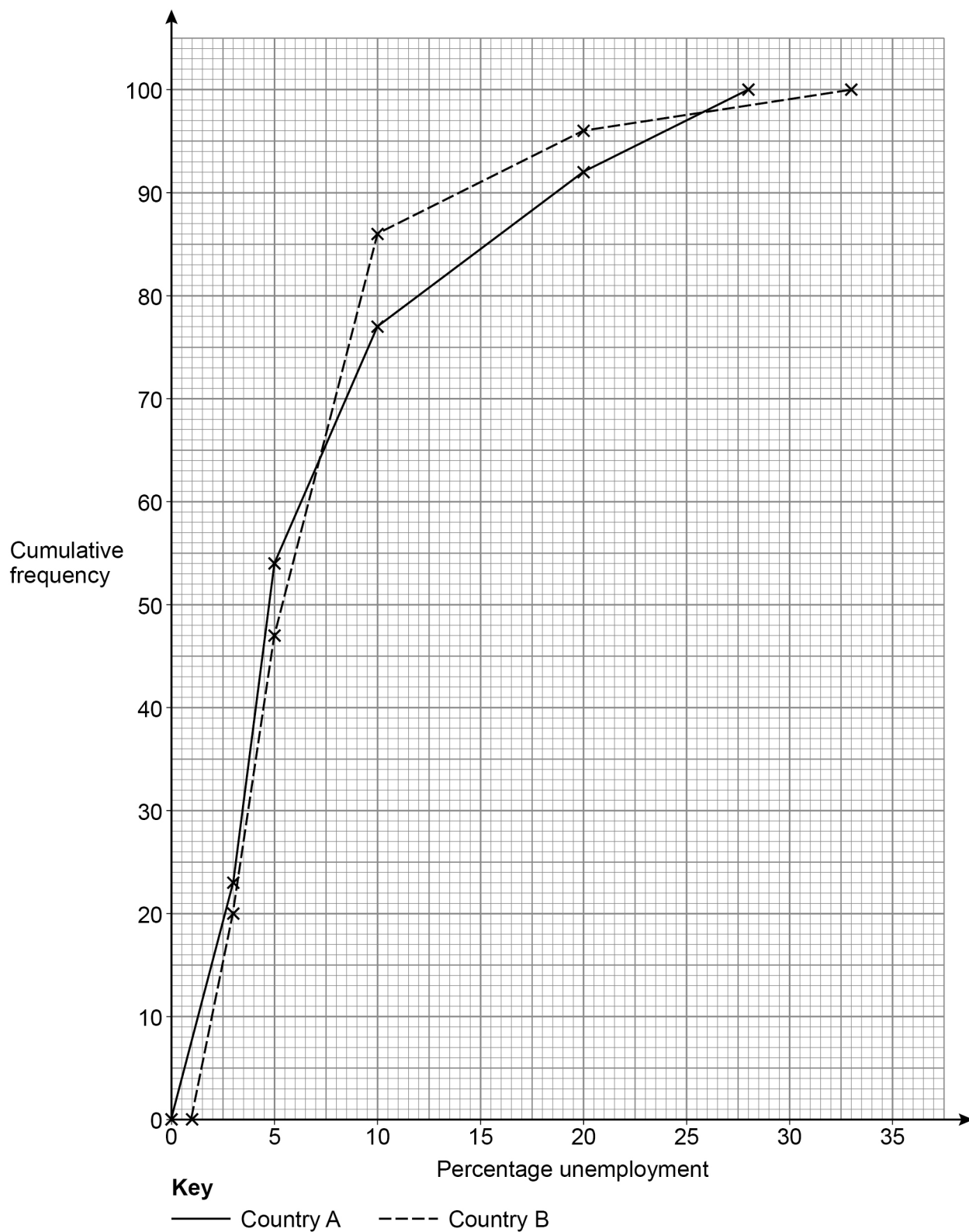
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14

The graph shows information about the percentage of unemployment for 100 towns in Country A and 100 towns in Country B.

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- 14 (a)** Using the graph, write down the median percentage unemployment for the towns in **Country A**.

[1 mark]

Country A _____ %

- 14 (b) (i)** 'There are more towns with between 10% and 20% unemployment in **Country A** than in **Country B**.'

How does the graph show this?

[1 mark]

- 14 (b) (ii)** 'Both countries have the same number of towns at or below two different values of percentage unemployment.'

Use the graph to write down these **two** values.

[2 marks]

Answer _____ % and _____ %

4

Turn over for the next question

Turn over ►



- 15** A pack of trading cards may or may not contain one rare card.
The probability that a pack contains a rare card is 15%.
Ciri buys 5 packs of trading cards.

- 15 (a)** Give **two** reasons why the number of packs that contain one rare card can be modelled by a binomial distribution.

[2 marks]

Reason 1 _____

Reason 2 _____

- 15 (b)** Ciri says

“The chance of getting **at least** one rare card in 5 packs is more than 50%.”

Show that Ciri is correct.

You **must** show your working.

[3 marks]



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16

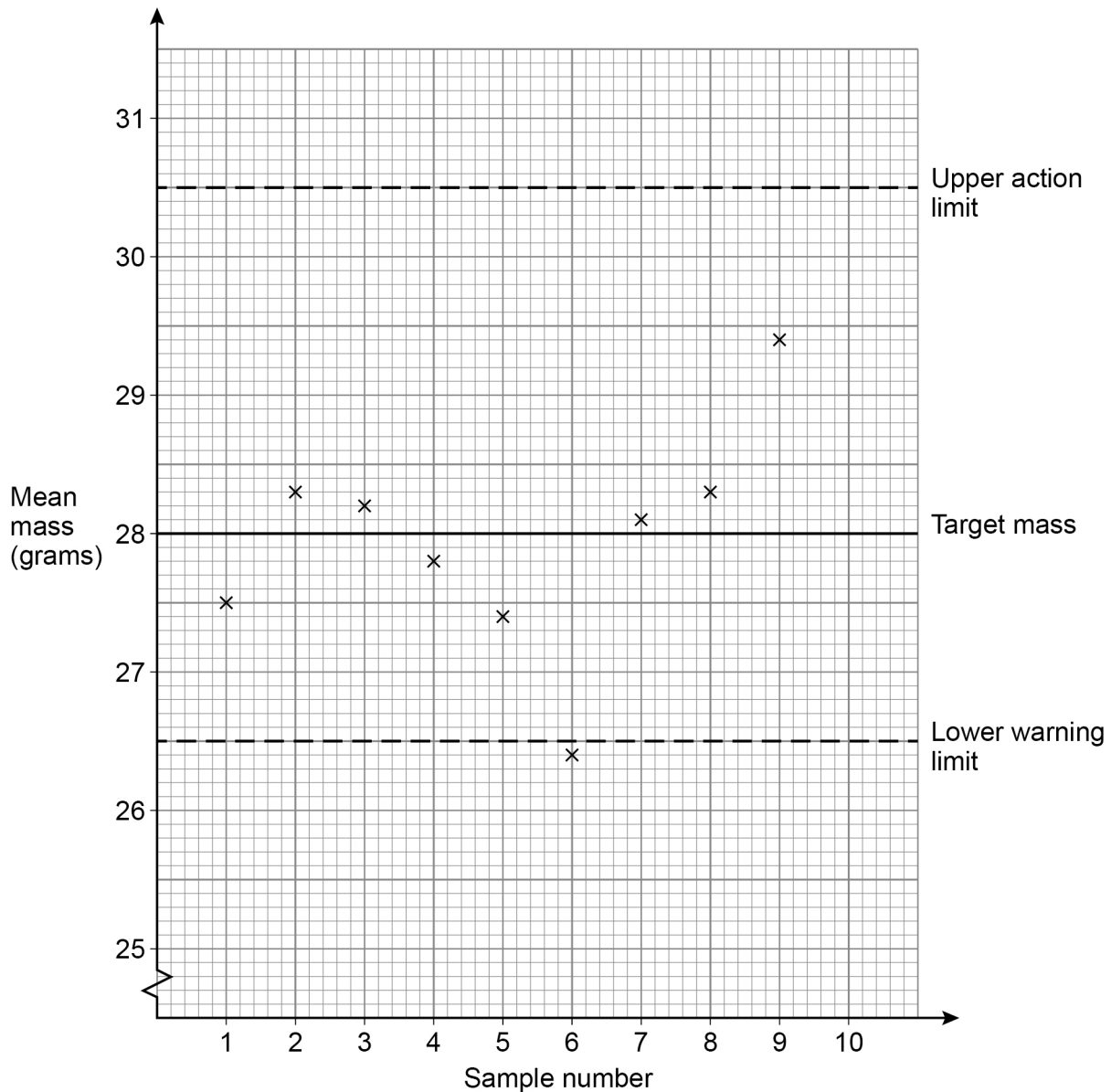
A company uses a machine to fill packets with crisps.

The target mass for a packet of crisps is 28 grams.

The upper action limit and lower warning limit, chosen by the company, are shown.

Samples of packets are taken from the machine each day to check that the machine is working correctly.

Nine sample means are shown on the incomplete control chart.



16 (a) (i) The 10th sample mean is 29.3 grams.

Plot this sample mean on the control chart.

[1 mark]

16 (a) (ii) The limit lines are symmetrical around the target mass.

Complete the control chart by drawing the lower action limit **and** the upper warning limit.

[2 marks]

16 (b) One sample causes an additional sample to be taken to check the machine is working correctly.

Which sample number is this?

[1 mark]

Answer _____

16 (c) An 11th sample is taken that has a mean of 30.7 grams.

What action should the machine operator take?

Give a reason for your answer.

[2 marks]

6

Turn over for the next question

Turn over ►



17

The table shows the percentage increase of the income of a business, as a multiplier.

Month	Multiplier
January	1.021
February	1.014
March	1.513
April	1.527
May	1.547

Aviv wants to know the average percentage increase.

Circle the average he should calculate.

[1 mark]

Arithmetic mean

Median

Standard deviation

Geometric mean

1



18 Between 2007 and 2009 Doctor Gorman collected data about penguins in Antarctica.

There were three different types of penguin,

- Adelie
- Chinstrap
- Gentoo.

18 (a) Beth wants to compare the masses of the three types of penguins.

Beth uses Doctor Gorman's data.

Write down **one** advantage of using this data.

[1 mark]

Question 18 continues on the next page

Turn over ►



18 (b) The table shows some of the data on 152 Adelie penguins.

Row	Mass (g)	Gender	Year recorded
1	3750	Male	2007
2	3800	Female	2007
3	3250	Female	2007
4			2007
5	3450	Female	2007
48	2975		2007
49	3450	Female	2007
50	4150	Male	2007
51	3500	Female	2008
52	4300	Male	2008
150	3750	Male	2009
151	3700	Female	2009
152	4000	Male	2009

18 (b) (i) There is one row that Beth **must** remove before using the data to investigate the **mass** of the penguins.

Write down the row number and give a reason for your answer.

[1 mark]

Row _____

Reason _____



- 18 (b) (ii)** There is one row that Beth **might** remove before using the data to investigate the **mass** of the penguins.

Write down the row number and give a reason for your answer.

[1 mark]

Row _____

Reason _____

Question 18 continues on the next page

Turn over ►



18 (c)

She finds that the lightest mass is 2850 g and the heaviest mass is 4775 g.

$$\sum x = 558\,800 \qquad \sum x^2 = 209\,947\,250 \qquad N = 151$$

You **must** show your working.

$$\text{Standard Deviation} = \sqrt{\frac{\sum x^2}{N} - \left(\frac{\sum x}{N}\right)^2}$$

[5 marks]

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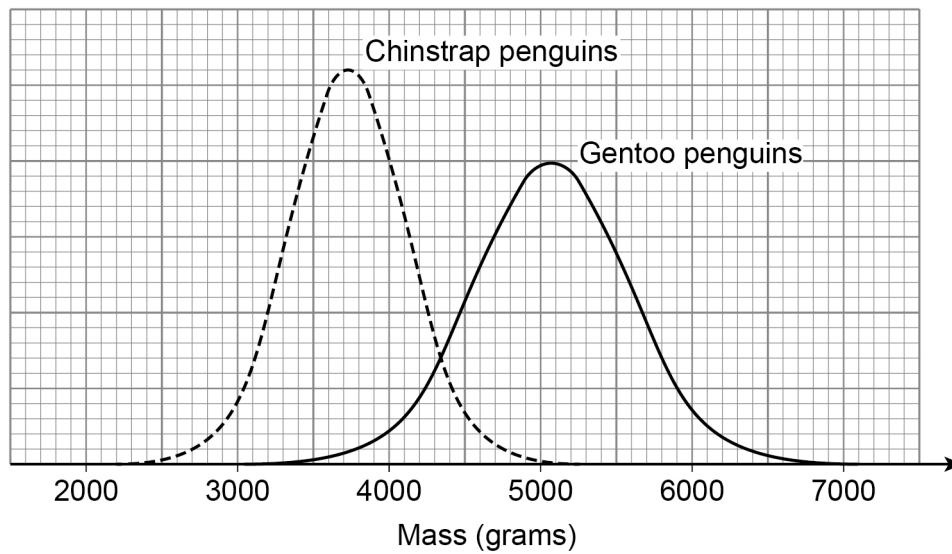
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- 18 (d)** Beth produces this graph showing the Normal distributions for the masses of Chinstrap and Gentoo penguins.



- 18 (d) (i)** Beth says,

“On average the Chinstrap penguins are heavier.”

Is Beth correct?

Tick (✓) a box.

Yes

☐

No

☐

Explain how the graph shows this.

[1 mark]

18 (d) (ii) Beth also says,

“The masses of Gentoo penguins are more varied.”

Is Beth correct?

Tick (✓) a box.

Yes

☐

No

☐

Explain how the graph shows this.

[1 mark]

Question 18 continues on the next page

Turn over ►



- 18 (e)** Beth wants to compare the lightest and heaviest penguins on a particular island. The table shows the standardised scores for these penguins.

	Lightest	Heaviest
Standardised Score	– 2.87	2.42

Which penguin is the furthest from the mean mass?

Tick (✓) a box.

Lightest ☐

Heaviest ☐

Cannot tell ☐

Give a reason for your answer.

[1 mark]

- 18 (f)** Using the table, comment on the reliability of using the normal distribution for the masses of each type of penguin.

[2 marks]

Penguin Type	Skew
Adelie	0.00433
Gentoo	0.452
Chinstrap	0.258

13

END OF QUESTIONS



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