Level 3 Mathematical Studies
Pre-Course Task

SECTION A
Statistics Review

Q1. Two-Way Tables

99 children each buy one drink.
They each buy cola or juice or water.

45 of these children are girls.
25 boys buy cola.
16 girls buy juice.
17 of the 37 children who buy water are boys.

Work out the number of children who buy cola.

.....

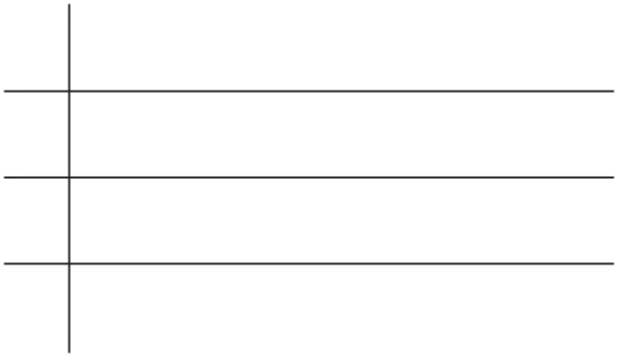
(Total for question = 4 marks)

Q2. Stem and Leaf

Chloe recorded the test marks of 20 students.

22	29	38	16	36	18	30	21	27	43
14	41	25	38	46	19	48	34	23	46

(a) Show this information in an ordered stem and leaf diagram.



(3)

One of these students is going to be chosen at random.

(b) Find the probability that this student has a test mark less than 28

.....

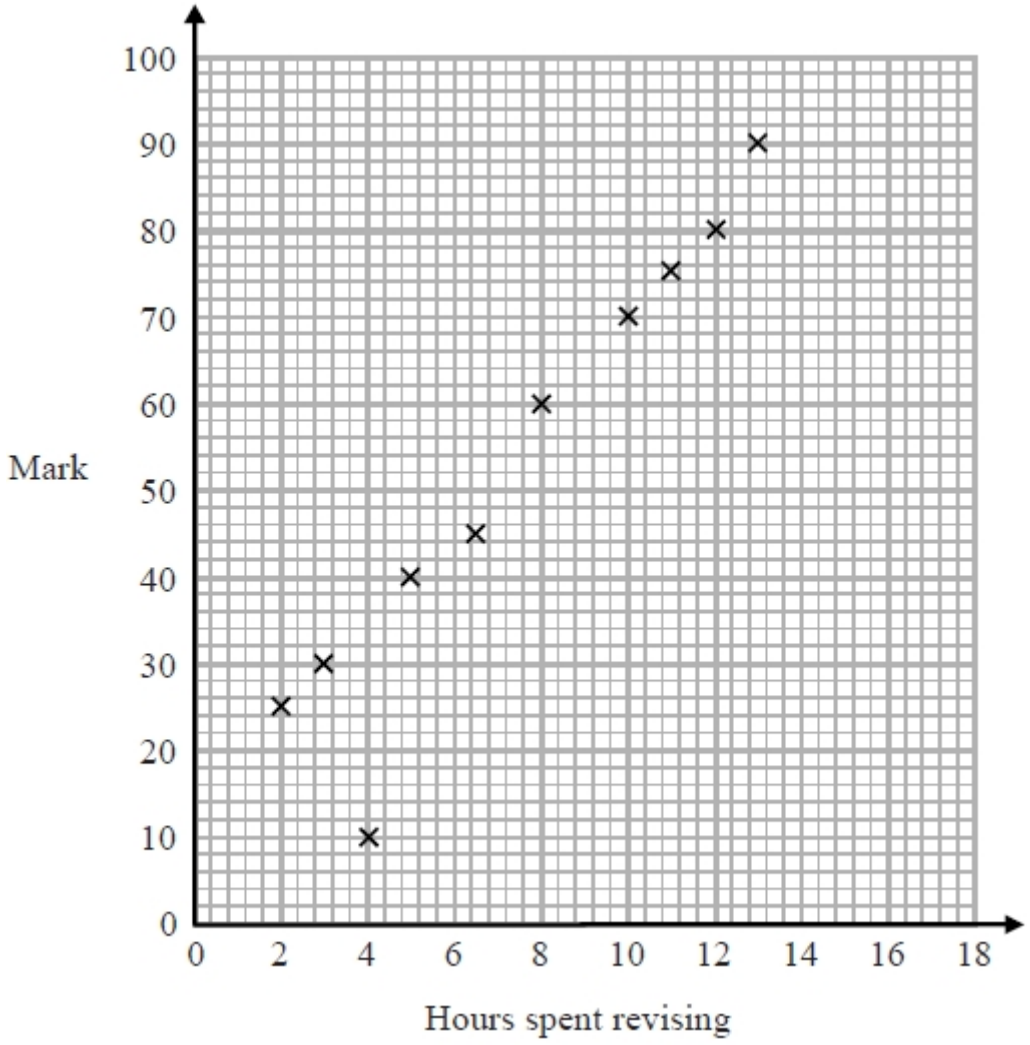
(2)

(Total for question = 5 marks)

Q3. Scatter Diagrams

The scatter diagram shows information about 10 students.

For each student, it shows the number of hours spent revising and the mark the student achieved in the Spanish test.



One of the points is an outlier.

(a) Write down the coordinates of the outlier.

.....

(1)

For all the **other** points

(b) (i) draw the line of best fit,

(ii) describe the correlation.

.....

.....

(2)

A different student studies for 9 hours.

(c) Estimate the mark gained by this student.

.....

(1)

The Spanish test was marked out of 100

Lucia says,

"I can see from the graph that had I revised for 18 hours I would have got full marks."

(d) Comment on what Lucia says.

.....

.....

(1)

(Total for question is 5 marks)

Q4. Frequency Polygons

The grouped frequency table gives information about the heights of 30 students.

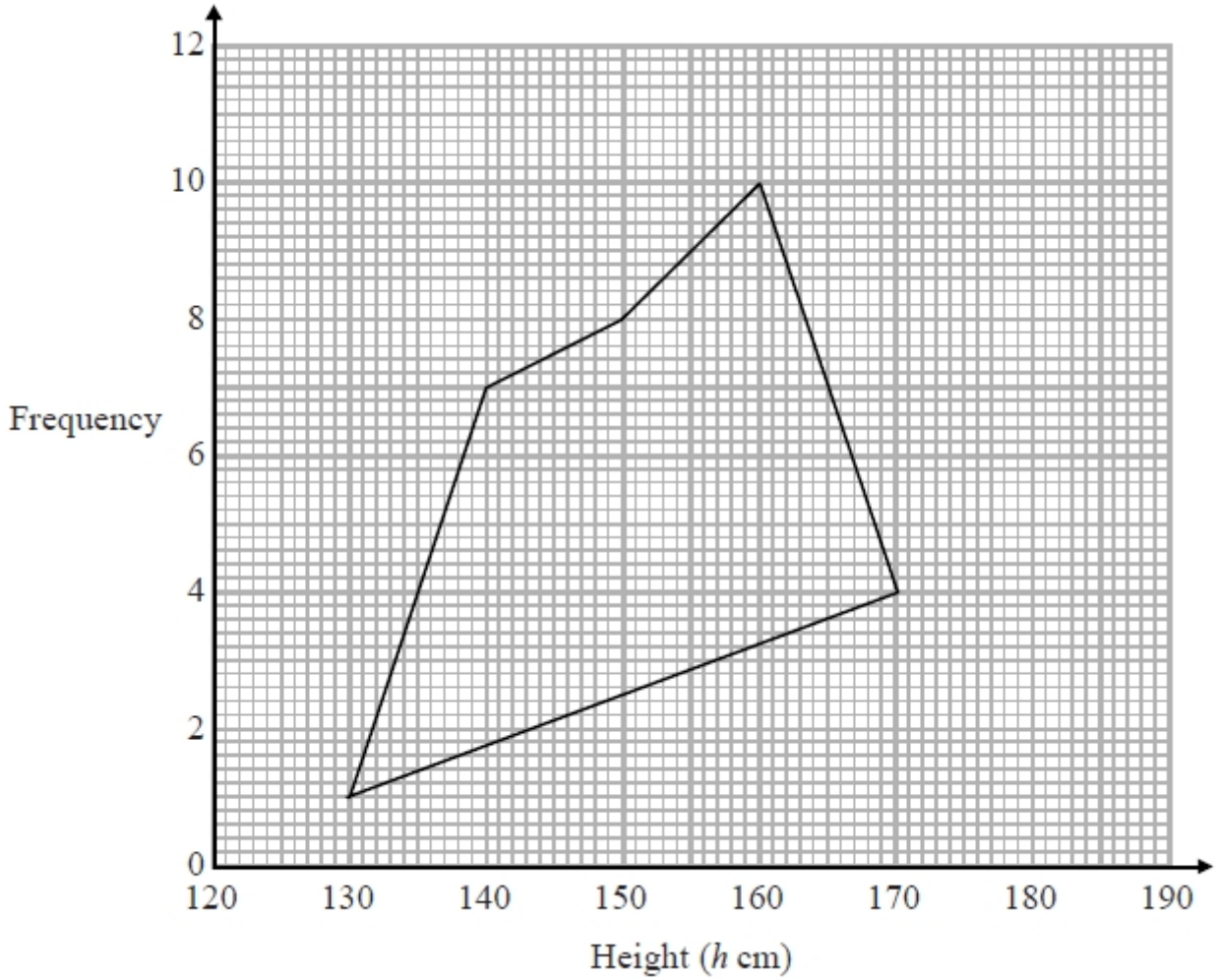
Height (h cm)	Frequency
$130 < h \leqslant 140$	1
$140 < h \leqslant 150$	7
$150 < h \leqslant 160$	8
$160 < h \leqslant 170$	10
$170 < h \leqslant 180$	4

(a) Write down the modal class interval.

.....

(1)

This incorrect frequency polygon has been drawn for the information in the table.



(b) Write down two things wrong with this incorrect frequency polygon.

1
.....

2
.....

(2)

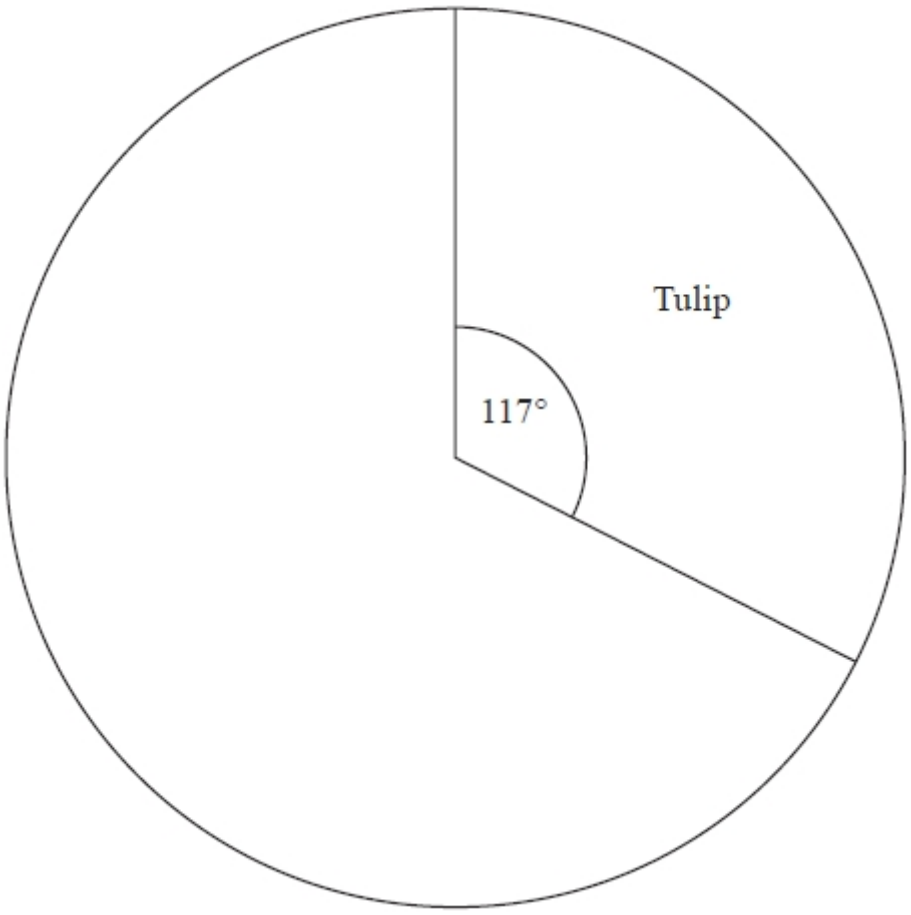
(Total for question is 3 marks)

Q5. Pie Charts

Linda planted 400 flower bulbs.
She planted daffodil bulbs, tulip bulbs and hyacinth bulbs.

The incomplete table and pie chart show some information about the bulbs.

Type of bulb	Number planted
Daffodil	180
Tulip	.....
Hyacinth	.....
Total	400



Complete the table and the pie chart.

(Total for question = 4 marks)

Q6. Mean Problem Solving

Walkden Reds is a basketball team.

At the end of 11 games, their mean score was 33 points per game.
At the end of 10 games, their mean score was 2 points higher.

Jordan says,

"Walkden Reds must have scored 13 points in their 11th game."

Is Jordan right?
You must show how you get your answer.

.....

(Total for question is 3 marks)

Q7. Stratified Sampling

There are 1200 students at a school.

Kate is helping to organise a party.
She is going to order pizza.

Kate takes a sample of 60 of the students at the school.
She asks each student to tell her **one** type of pizza they want.

The table shows information about her results.

Pizza	Number of students
ham	20
salami	15
vegetarian	8
margherita	17

Work out how much ham pizza Kate should order.
Write down any assumption you make **and** explain how this could affect your answer.

.....

.....

(Total for question = 3 marks)

Q8. Estimate the Mean for Grouped Data

Alice is a lorry driver.

She recorded the distance she drove on each of 40 trips.

The table gives information about these distances.

Distance (d miles)	Frequency
$400 < d \leqslant 450$	9
$450 < d \leqslant 500$	15
$500 < d \leqslant 550$	12
$550 < d \leqslant 600$	4

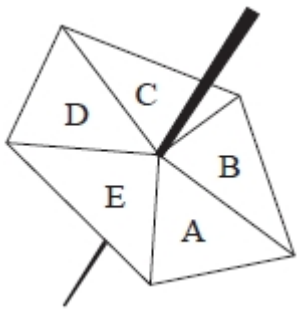
Work out an estimate for the mean distance.

..... miles

(Total for Question is 4 marks)

Q9. Calculate Probability /Expected Frequency

Here is a five-sided spinner.



The table shows the probabilities that the spinner will land on A or on B or on C or on D.

Letter	A	B	C	D	E
Probability	0.25	0.10	0.20	0.15	

Kirsty spins the spinner once.

(a) Work out the probability that the spinner will land on E.

.....

(2)

Chris is going to spin the spinner 60 times.

(b) Work out an estimate for the number of times the spinner will land either on A or on B.

.....

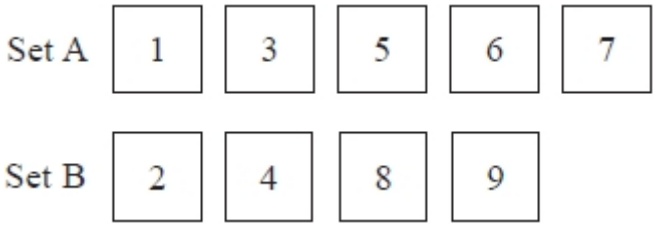
(3)

(Total for question = 5 marks)

Q10. Probability / Expectation

* Laura is raising money for charity.

She has a game with two sets of cards.



80 students are each going to play Laura's game once.

Each student takes at random one card from each set of cards.
They add the two numbers to get a total score.

Each student pays 70p to play the game.
Laura pays £3 to any student getting a total score of 9

Show that Laura can expect to make a profit of £20
You must show all your working.

(Total for question = 5 marks)

SECTION B
Making Informed Estimates

How long would it take you to walk to Beijing?

In answering this question, you should try to make your answer as realistic as possible and be prepared to justify what you have written. You should:

- Show all working
- State all the assumptions that you have made in reaching your conclusion
- Explain how you could improve the accuracy of your answer

Be prepared to present your answer and thought process to the rest of the group in your first lesson.