Getting Ready For
Statistics

Your Name		
A Level Statistics	GCSE Knowledge Required for A Level	Edexcel

We are delighted you have chosen to study Statistics at Haywards Heath College.

Instructions: This pack will help you make the best possible start to studying this subject.

The tasks in this pack:

- Should take you about 4 hours to complete
- Should be handed in to your teacher when teaching starts with your name on it for assessment

If you need help: The course is designed to get more difficult as you work through it, as it prepares you for studying at a higher level and becoming an effective independent learner. You should try to get as far as you can working on your own but if you need help, please email me on **GreenA2@haywardsheath.ac.uk** , telling me which Getting Ready For task you are working on and what help you need. A picture of your work can be really helpful too! Help is available throughout the summer holidays.

Skills Focus for this Getting Ready for Pack	
- The ability to choose the correct method to solve a problem. - Your quality of English communication when a written answer is required. - Clarity of statistical communication – how well you show your workings and lay out your work. - Accuracy of numerical calculations. - Marking and correcting your work, revising any topics you have forgotten.	Subject knowledge from GCSE Maths or GCSE Statistics including: - Measures of Central Tendency – Mean, Mode, Median - Measures of Spread – Standard deviation, Median, Range - Probability - Populations and samples - Graphical representation of the data eg pie charts, bar charts, histograms

What is This Course About?

▶ Numerical measures

▶ Probability

▶ Hypothesis testing

▶ The Statistical Enquiry Cycle

▶ Data representation

▶ Calculations and Interpretation

Exams

▶ You will take 3 exams at the end of your course, each counting 1/3 towards your overall mark. These papers are in Data and Probability, Statistical Inference and Statistics in Practice. We use the Edexcel exam board

Independent Work and Expectations

▶ TEAMS has everything you need!!!

▶ It is your responsibility to ensure you know which week it is and what work is due. Your teacher will not "set homework" in the lesson as it has already been set on Teams.

▶ You should assume that SSP tasks are due the first lesson of the week with a little test of the work in class

▶ You should spend **4-6 or 8-12!!! hours** each week on Statistics independent study

Summer Work – Introduction to Statistics		
Type of Task	Task	Deadline
Exam Style Questions	***Task 1: GCSE Maths Refresher*** This worksheet of GCSE exam style questions will refresh your knowledge of data and probability. In statistics you also need to be able to calculate with percentages and read information from tables so there are also some questions on those topics. If possible, print the worksheet and write your answers on the sheet (show all working clearly). The answers are provided so you can check as you go along. If you don't have access to a printer then you will need to read the questions on screen and write your answers on lined paper. If you have forgotten how to answer a particular problem, then please take the time to research the answer. Your old GCSE revision notes may help, there are also various websites that have videos available eg, Hegarty maths and examsolutions.net. Please tick or correct your work in a different coloured pen so that we can see that you have checked your answers. As we have provided answers, we expect you to get all the answers correct. What we are looking for is how you write out your working (some questions may require more working than others). If there is a question you really don't understand then please write a comment and we will know to help you with this topic. If you are in need of help, please feel free to contact me on **GreenA2@haywardsheath.ac.uk**, telling me which Getting Ready For pack you are working on and what help you need.	First lesson of term
Calculator Emulator	***Task 2: Graphical calculator*** You will be using a graphical calculator throughout this course. You need to buy a CASIO FX-991EX or FX-CG50 (recommended) within the first week of term. These can sometimes be picked up second hand on ebay. We will be using the calculator from the first lesson but if you don't have one we can lend you a ClassWiz to use in the lesson. These tasks enable you to get familiar with one of the features of the calculator (either using your own calculator or by downloading an emulator). If you are in need of help please feel free to email me on **GreenA2@haywardsheath.ac.uk** , telling me which Getting Ready For pack task you are working on and what help you need.	First lesson of term
TEST Paper	***Task 3: Test Paper*** There are 9 questions on the paper, 42 marks. Please have a go at all the questions. We will be marking the paper/going through it during our first lesson in September.	First lesson of term

Name: _____

Task 1

<u>**Getting Ready For A Level Statistics**</u>

<u>**Section A: Analysing Data**</u>

Q1. A small building company has 10 employees.
The table shows their monthly salaries.

Job	Number of employees	Monthly salary
Labourer	5	£1200
Driver	3	£1400
Supervisor	1	£2500
Manager	1	£13 500

(a)   What is the modal monthly salary?

Answer £ ....

(1)

(b)   The median monthly salary is £1300
Explain why.

....

....

(1)

(c)   The mean monthly salary is £2620

Give a reason why the mean is not the best average to use for the 10 employees.

....

....

....

....

(1)
(Total 3 marks)

Q2. Class A had a spelling test of ten words.
The table shows their marks.

Class A

Mark	Frequency	
5	4	
6	2	
7	8	
8	10	
9	6	
	Total = 30	

(a)   Show that the mean mark is 7.4

....

....

....

(3)

(b)   Class B had the same test.
The mean mark for Class B is 6.5

The teacher says,
                        "On average, Class A scored 15% higher than Class
B.

Is she correct?
You **must** show your working.

....

....

....

(3)
(Total 6 marks)

Q3. Chen records his journey times to college.

Time, t (minutes)	Frequency
$25 < t \leq 30$	12
$30 < t \leq 35$	18
$35 < t \leq 40$	24
$40 < t \leq 45$	6
	Total = 60

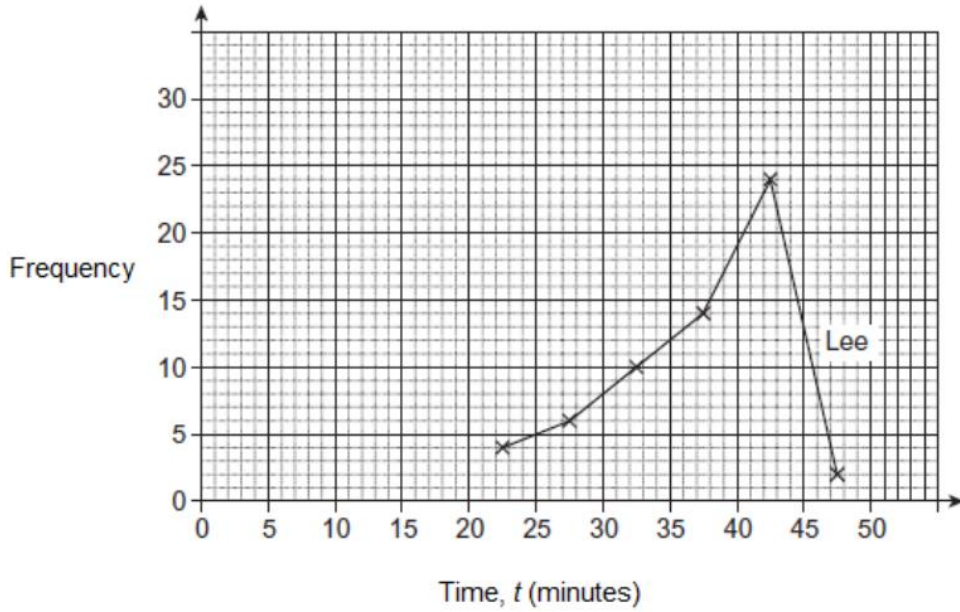(a)   Calculate an estimate of his mean journey time.

....

....

....

....

....

Answer .... minutes

(4)

(b)   Explain why your answer to part (a) is an estimate.

....

....

(1)

(c)   The frequency polygon shows Lee's journey times to college.

Journey times to college

Time, t (minutes)

On the same grid, draw a frequency polygon for Chen's journey times.

(2)

(d)   An estimate of Lee's mean journey time is 37 minutes.

Compare the journey times for Lee and Chen.

Comparison 1 ....

....

Comparison 2 ....

....

(2)
(Total 9 marks)

Q4. The table shows data about the times for men and women in a race.

	Mean	Interquartile range
Men	34m 50s	6m 30s
Women	40m 10s	4m 45s

Use data from the table to make **two** comparisons between the performances of the men and women in the race.

Comparison 1

....

....

....

....

Comparison 2

....

....

....

....

(Total 2 marks)

Q5. Here is a list of numbers.

| 0 | 3 | 5 | 7 | 12 | 29 |

Find **three** numbers from the list with the range double the median.
Write down the values of the range and median.

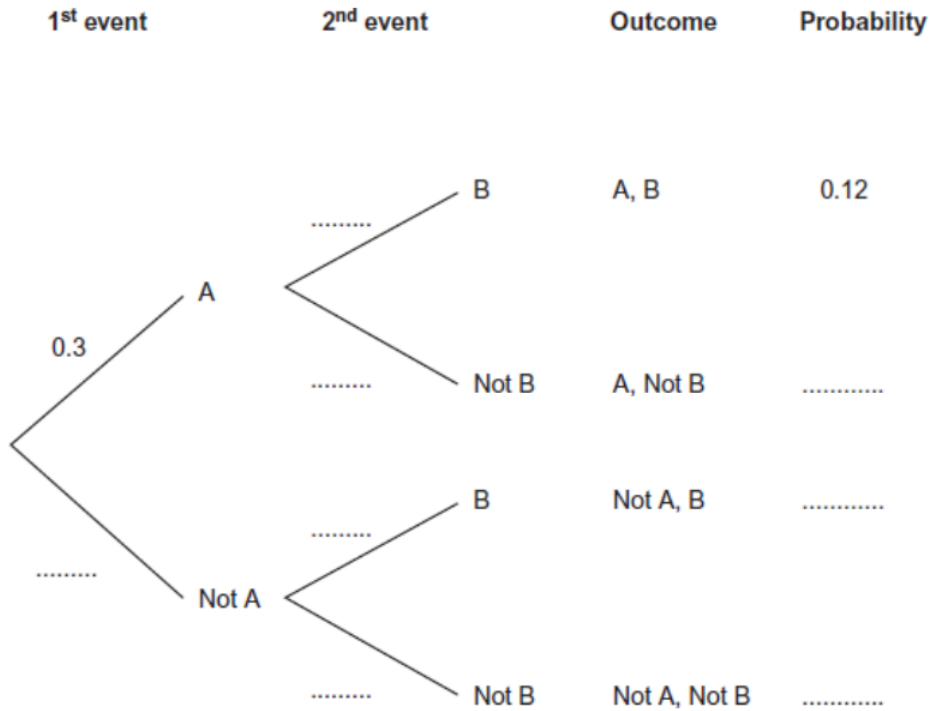..

....

....

Answer .... , ... and ....

Range = ... Median = ...

(Total 3 marks)

Section B: Probability

Q1. A and B are independent events.

Fill in **all** eight missing probabilities in the diagram below.

1st event	2nd event	Outcome	Probability


```
1st event          2nd event          Outcome          Probability

                   .........  B        A, B             0.12
          A
    0.3
                   .........  Not B    A, Not B         ............

                   .........  B        Not A, B         ............
    .........
          Not A
                   .........  Not B    Not A, Not B     ............
```

(Total 4 marks)

Q2. John goes to work by car or by train.

(a)   The probability that John goes by car is 0.4

Work out the probability he goes by train.

....

Answer ....

(1)

(b)   John works for 200 days each year.

How many days would you expect him to go to work by car?

....

Answer ....

(2)

(c)   Ben also goes to work by car or by train.
Out of 200 days, he went by car on 150 days.

Work out the relative frequency that Ben goes to work by car.

....

....

Answer ....

(1)
(Total 4 marks)

Q3. 50 cars arrive at a car park.
The table shows the number of people in each car.

Number of people	Number of cars
1	9
2	12
3	18
4	7
5	4

(a)   One of the cars is chosen at random.

Work out the probability that there are **more than 3** people in the car.

Answer ....

(2)

(b)   Work out the total number of people in the 50 cars.

....

Answer ....

(2)
(Total 4 marks)

Q4. Bag A has 2 black counters and 3 white counters.

Bag B has 3 orange counters and 4 green counters.

A counter is chosen at random from each bag.

(a) Complete the tree diagram.

Bag A   **Bag B**

```
                                              orange
                              3/7
                    black
     2/5                                      green
                                              orange
                    white
                                              green
```
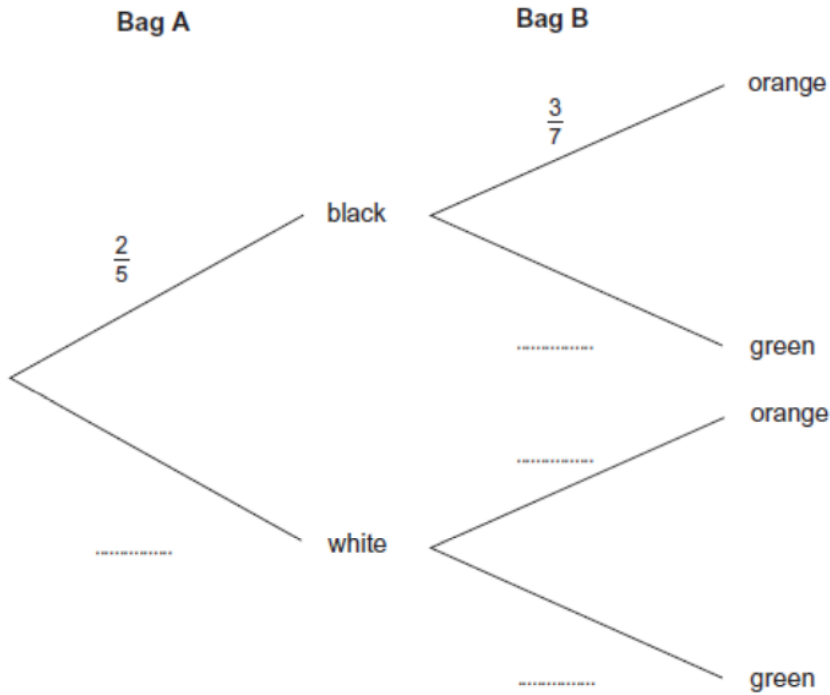
(2)

(b) What is the probability of choosing a black counter and an orange counter?

....

....

....

Answer ....

(2)
(Total 4 marks)

Q5. A bag contains only red counters and blue counters.
There are 6 **more** red than blue.

A counter is chosen at random from the bag.

The probability it is blue is $\frac{1}{4}$

How many **red** counters are in the bag?

....

Answer ....

(Total 3 marks)

Q6. Fair spinner A has five equal sections labelled 1, 2, 3, 4, 5.
Fair spinner B has five equal sections labelled 6, 7, 8, 9, 10.

Each spinner is spun once and the numbers are added.

Work out the probability that the total is 12 or more.

....

Answer ....

(Total 5 marks)

Q7. The probabilities of whether a student, picked at random from a school, is vegetarian or not are shown in this table.

	Boys	Girls
Vegetarian	0.08	0.2
Non-vegetarian	0.4	0.32

(a) What is the probability that a student chosen at random from the school is vegetarian?

Answer ....

(1)

(b) There are 320 girls in the school who are vegetarian.
How many students are there in the school altogether?

Answer .... students

(2)
(Total 3 marks)

Q8. An ordinary fair dice is rolled 120 times.

How many times would you expect to roll a 6?

Answer ....

(Total 2 marks)

Q1. The diagram shows information about the exports of a company.
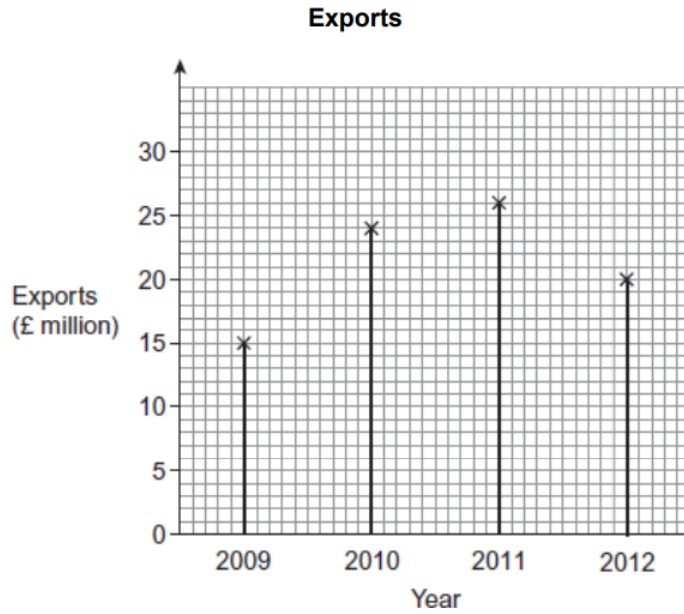
Exports

(a) Work out the **increase** in the exports from 2009 to 2010.

....

Answer £...million

(2)

(c) The pie chart shows information about the exports of the company in 2012.
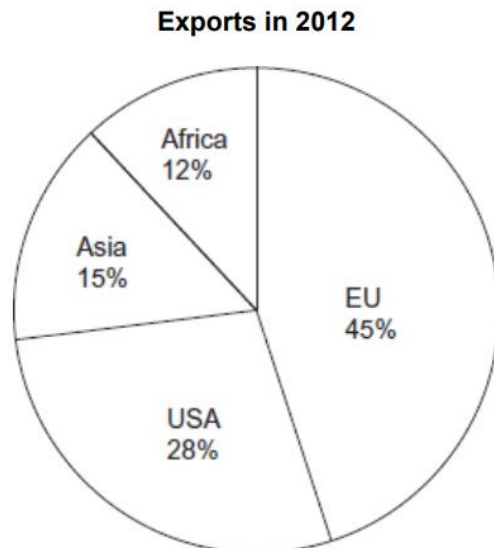
Exports in 2012

Use **both** diagrams to work out the value of the exports to the **USA** in 2012.

....

Answer £...million

(3)
(Total 6 marks)

Q2. Here are three offers for a computer.

Tablet World	IT Supplies	PC Heaven
Usual price £170	Usual price £180	Special offer
20% off	$\frac{1}{4}$ off	Pay £23 each month for 6 months

Which offer is the cheapest?
You **must** show your working.

....

....

Answer ....

(Total 6 marks)

Q3.(a)   Here is information about animals in a rescue centre.

- Half of the dogs are male.

- 25% of the rabbits are female.

- There are 20 more males than females altogether.

Complete the two-way table.

	Dog	Cat	Rabbit	Total
Male				
Female				
Total	42	18	20	80

(4)

(b)   42 of the 80 animals are dogs.

What percentage of the animals are dogs?

....

....

Answer .... %

(2)
(Total 6 marks)

Q4. In a survey people had to choose A, B, C or D.

The percentages for B, C and D are shown.

A	B	C	D
	25%	35%	30%

150 people chose B.

How many people chose A?

....

Answer ....

(Total 4 marks)

Q5. A school only has pupils in Year 7, Year 8 and Year 9.

The table shows information about pupil absence on one day.

	Year 7	Year 8	Year 9
Number of pupils in year group	380	400	420
Number of pupils absent	28	32	36

The target for daily attendance is 93% or more for the whole school.

Did the school meet the target that day?

....

....

....

....

....

(Total 5 marks)

Q6. The table shows the GCSE Mathematics results of the students in a school.

Grade	U	G	F	E	D	C	B	A	A*
Number of students	0	14	30	53	37	41	22	28	17

Work out the percentage of students with grade C or higher.
Give your answer to 3 significant figures.

....

....

....

Answer ....%

(Total 5 marks)

Q8. Here is some information about tourism in 2012

Country visited	Number of tourists (millions)	Total spent by tourists ($ millions)
France	83.0	53 600
USA	67.0	126 200
Spain	57.7	55 900

(a)   How many **more** tourists visited France than Spain?

....

Answer .... million

(2)

(b)   21% of the total spent by tourists in the USA was by Canadians.

Work out the amount spent by Canadian tourists in the USA.

....

....

....

....

Answer $ .... million

(2)

(c)   In the UK the total spent by tourists was $36 600 million.
There were 29.3 million tourists.

Work out the average spent per tourist in the UK.
Give your answer to the nearest $10

....

....

Answer $ ....

(3)
(Total 7 marks)

Answers & hints (not every answer is given, we will mark the others).
You must show some working to show that you haven't just copied these answers!

Section A

1a 1200
1b mid point of 1200 and 1400 (between 5th and 6th person)

2a mark x freq then divide by 30

2b No.   0.9/6.5 = 13.8% or 15% of 6.5 is 0.975

3a 2070/60 = 34.5 (you need mid points)

3d compare means, modes or ranges (quote numbers in your answer)

4 One comment comparing means and one comparing IQRs (spread/consistency)

5 5,12,29 is a possible answer (range = 24, median = 12)

Section B

1 0.7, 0.4 & 0.6, 0.18, 0.28, 0.42   (the 0.4 comes from 0.12/0.3)

2 0.6, 80, 0.75

3 29/50, 135 (show working)

4b 6/35

5 9

6 10/25 (draw a two-way table)

7 0.28, 1600 (show working)

8 20 (show working)

Section C

1a 9   **1b** 30   **1c**   5.6

2 136, 135, 138

3a   21, 14, 15, 50
            21, 4,   5,   30

3b 52.5%

4 60

5 96/1200 No

6 108/242 = 44.6

7 25.3

7b 26502

7c $1250

Name: _____

Task 2

Introduction to Graphical Calculators

As mentioned, it is very important to buy a graphical calculator. The recommended model is the Casio FX-CG50. This is a bit more expensive, but has more useful functionality than other models, so if it is possible, this is the best one to buy. The screenshots below are from a similar model of calculator, that you should be able to download an emulator for if you don't have your own calculator yet. Please contact me on **GreenA2@haywardsheath.ac.uk** if you are having issues with the software

[fx9860emulator.exe (dropbox.com)](fx9860emulator.exe)

(This does not harm your computer)

Step 1 - Click the DOWNLOAD button followed by clicking DIRECT DOWNLOAD
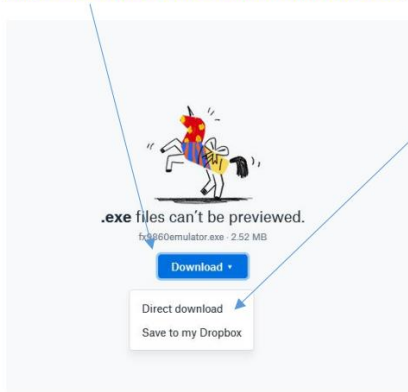
Step 2

Open the file and the calculator will appear on your computer. Pin it to the taskbar

To use normal calculator functions, press MENU, then press 1 on the main menu (RUN

MAT). To calculate numerical measures, press 2 on the main menu (STAT).

During your course you will get very familiar with the workings of your calculator. The next two tasks just introduce you to it. If you get stuck the MENU or EXIT keys are good for getting you back to the start. You will also find lots of videos on youtube and instructions online on how to use these calculators.

Task 2a

The heights of the Cambridge men's crew in the 2017 University Boat race

were:188 189 208 196 194 193 194 193 (numbers all in cm)

Follow these instructions on your graphical calculator:

MENU 2 (STAT)

If there is anything already in the lists you will need to clear them. **F6** then **F4** (DEL-A) should do

this. Enter the data above into List 1 (press the blue **EXE** key after each number)
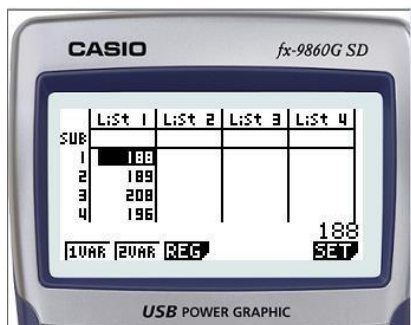
Press **CALC** (you may need F6 to get back to the original menu then F2 for

CALC) Press **F6** for **SET** to check your calculator is set up correctly for this

question.

1 Var X List: List 1 (this tells the calculator that you have entered the data in list 1)

1Var Freq: 1 (this tells the calculator that there is no frequency list there is just one of each number)

The blue EXE button will return you to the list screen (EXE is for execute and replaces the equals sign)

Press F1 for 1VAR (because you only have 1 variable)

You will then see a screen of results. Use the big grey round button to scroll up and down. See if you can work out what each of these numbers represent (hint: you should find mean and median and more)

Copy out all of the results from your calculator (or take screenshots) and write next to each number an explanation of what it is. See if you can work out what they all are.

Calculate the range and the interquartile range. Hand in this work in your first lesson.

Task 2b

The frequency table below shows the results of a survey where teenagers were asked how many siblings they had:

Number of siblings	Frequency
0	28
1	40
2	17
3	4
4	4
5	2

Enter these numbers into List 1 and List 2 of your calculator (you will need to delete the data you already have in list 1)

In the SET menu change the setting to show that the frequency is in list 2: (use the grey round button to scroll down then F2 to select the list you want)

Then, as before, exit this screen and press F1 for 1Var statistics.

Copy out these results and annotate with a comment to show that you understand where each number has come from and how it was calculated. The trickiest one will be standard deviation but if you would like an extra challenge, research how this can be calculated by hand and see if you can match the calculator's result.

Bring this work to your first lesson

Please attempt all questions. We will go through the answers in our first lesson.

(9 Questions 42 marks)

1.

The times that 48 trains left a station on Monday were recorded.

The cumulative frequency graph gives information about the numbers of minutes the trains were delayed, correct to the nearest minute.
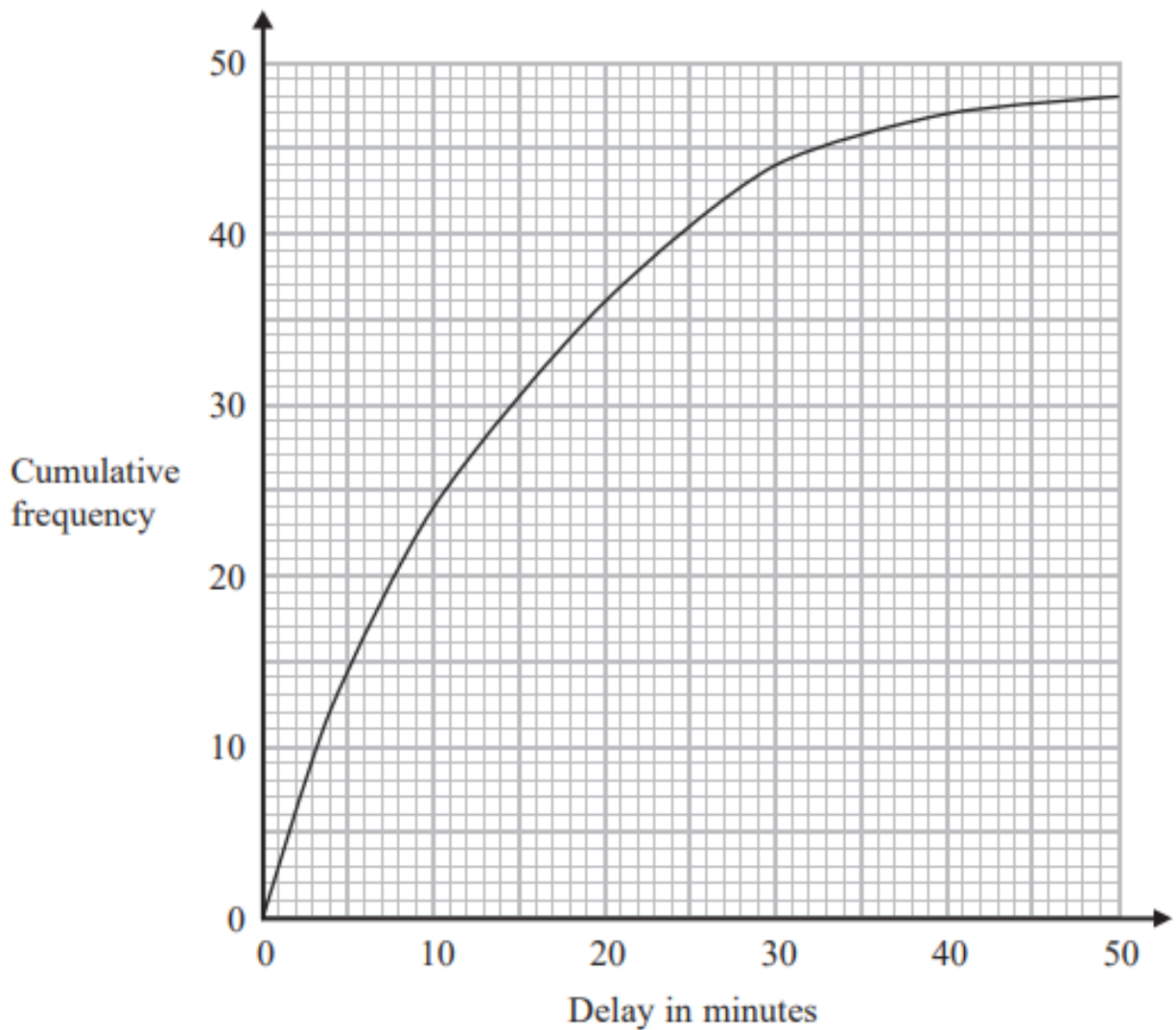
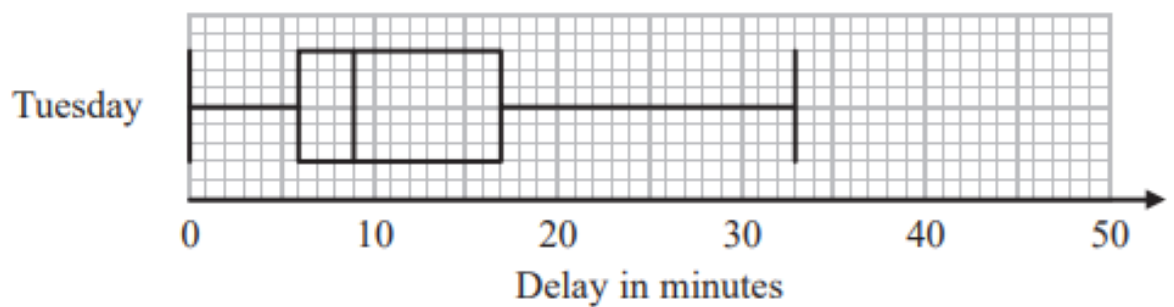The shortest delay was 0 minutes.
The longest delay was 42 minutes.

(a) On the grid below, draw a box plot for the information about the delays on Monday.

Monday

```
0        10        20        30        40        50
                Delay in minutes
```
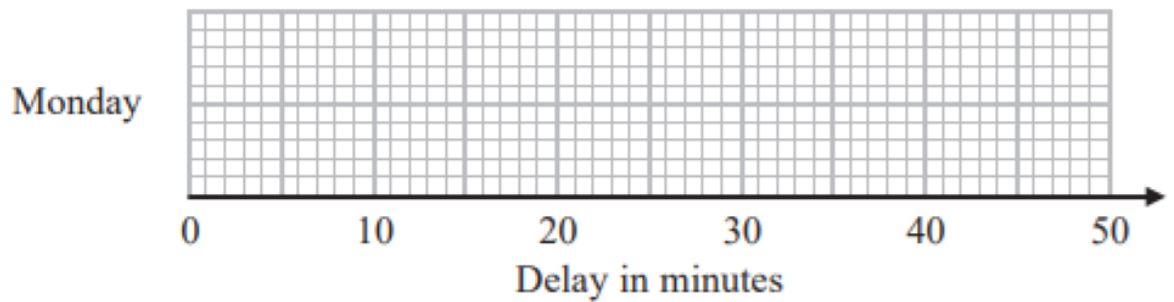
(3)

48 trains left the station on Tuesday.
The box plot below gives information about the delays on Tuesday.

Tuesday

```
0        10        20        30        40        50
                Delay in minutes
```

(b) Compare the distribution of the delays on Monday with the distribution of the delays on Tuesday.

_____

_____

_____

_____

(2)

Mary says,

"The longest delay on Tuesday was 33 minutes.
This means that there must be some delays of between 25 minutes and 30 minutes."

(c) Is Mary right?
You must give a reason for your answer.

_____

(1)

6 marks)

2.

There are only green pens and blue pens in a box.

There are three more blue pens than green pens in the box.
There are more than 12 pens in the box.

Simon is going to take at random two pens from the box.

The probability that Simon will take two pens of the same colour is $\dfrac{27}{55}$

Work out the number of green pens in the box.

6 marks)

3.

$\mathscr{E}$ = {even numbers between 1 and 25}
A = {2, 8, 10, 14}
B = {6, 8, 20}
C = {8, 18, 20, 22}

(a) Complete the Venn diagram for this information.
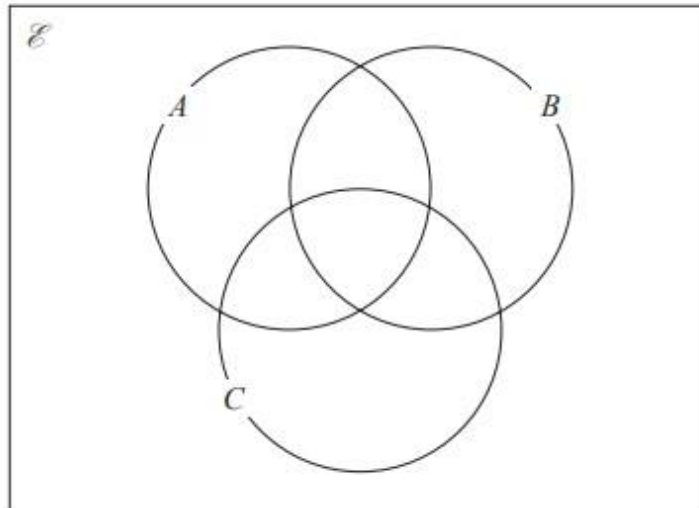
(4)

A number is chosen at random from $\mathscr{E}$.

(b) Find the probability that the number is a member of $A \cap B$.

....

(2)

6 marks

4.

Sean has information about the height, in cm, and the weight, in kg, of each of ten rugby players.

He is asked to draw a scatter graph and a line of best fit for this information.

Here is his answer.
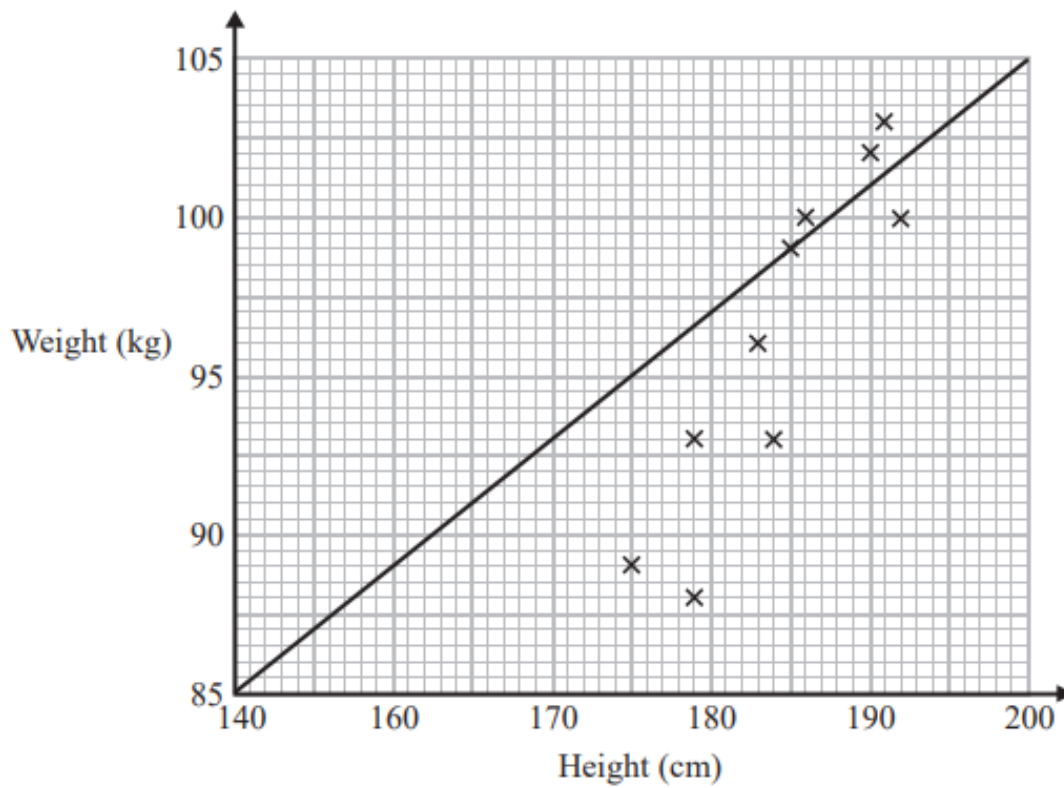
Sean has plotted the points accurately.

Write down two things that are wrong with his answer.

1 ....

....

2 ....

....

2 marks)

5.

There are only red counters and blue counters in a bag.

Joe takes at random a counter from the bag.
The probability that the counter is red is 0.65
Joe puts the counter back into the bag.

Mary takes at random a counter from the bag.
She puts the counter back into the bag.

(a) What is the probability that Joe and Mary take counters of different colours?

(2)

There are 78 red counters in the bag.
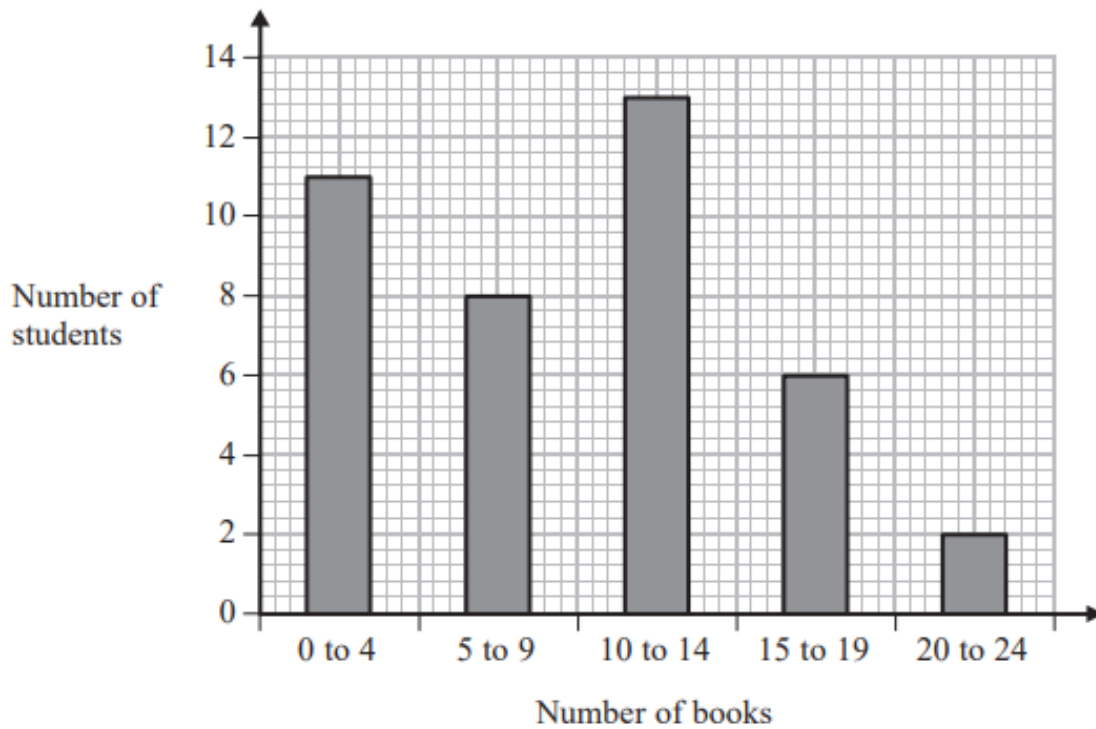
(b) How many blue counters are there in the bag?

(2)

4 marks

6.

Fran asks each of 40 students how many books they bought last year.

The chart below shows information about the number of books bought by each of the 40 students.

(a) Work out the percentage of these students who bought 20 or more books.

....%

(2)

(b) Show that an estimate for the mean number of books bought is 9.5
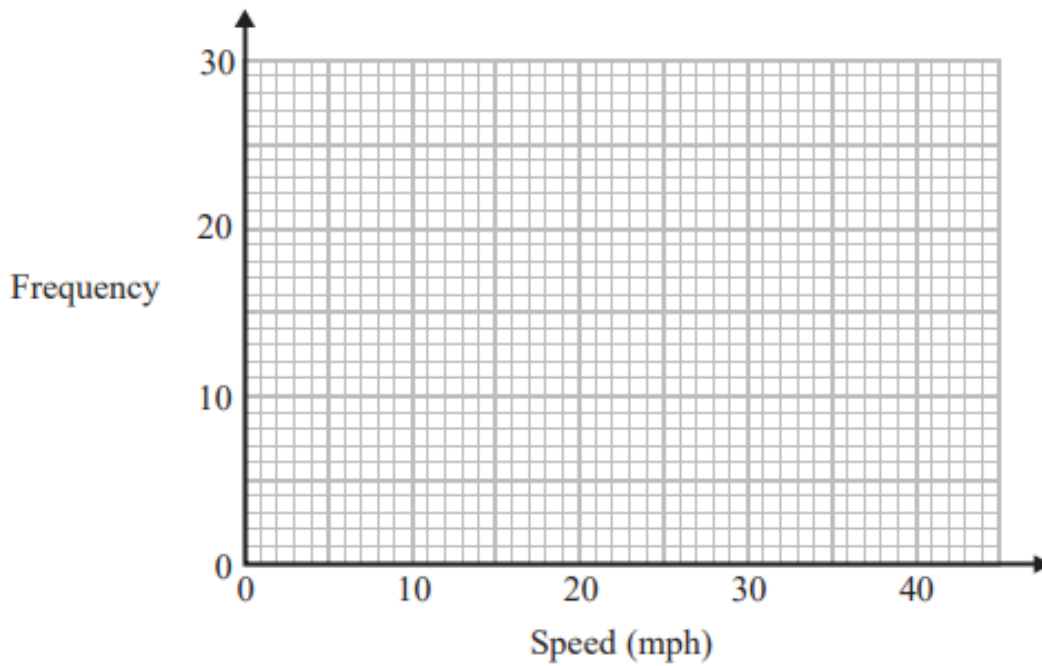You must show all your working.

(4)

6 marks)

7.

The table gives information about the speeds of 70 cars.

Speed (s mph)	Frequency
$0 < s \leqslant 10$	14
$10 < s \leqslant 20$	18
$20 < s \leqslant 30$	26
$30 < s \leqslant 40$	12

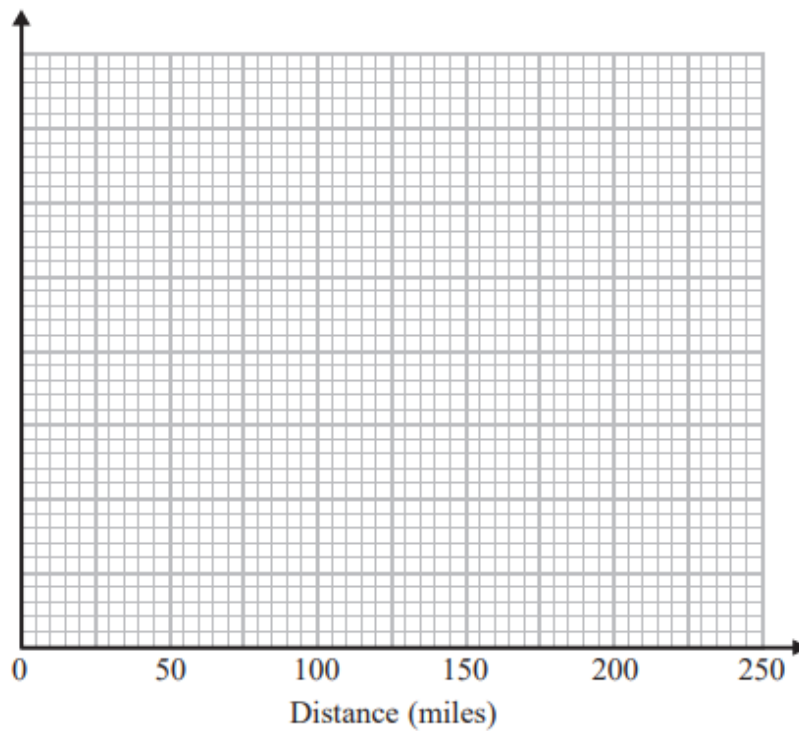Draw a frequency polygon for this information.

(Total for Question 7 is 2 marks)

8.

The table shows information about the distances 570 students travelled to a university open day.

Distance (d miles)	Frequency
$0 < d \leqslant 20$	120
$20 < d \leqslant 50$	90
$50 < d \leqslant 80$	120
$80 < d \leqslant 150$	140
$150 < d \leqslant 200$	100

(a) Draw a histogram for the information in the table.

Distance (miles)

(3)

(b) Estimate the median distance.

.... miles

(2)

5 marks

9.

Solve algebraically the simultaneous equations

$$2x^2 - y^2 = 17$$
$$x + 2y = 1$$

(5 marks)