



Edmonton County School
Educating our Community for Success

Mathematics Faculty

Mathematical Studies

Transition Booklet

MATHS



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MATHS FACULTY EXPECTATIONS

Dear Mathematician,

The Maths faculty would like to take this opportunity to congratulate you on your GCSE results and welcome you onto the KS5 Maths courses. We trust that you will enjoy the course and work hard to achieve your full potential. Please read through the following points and ensure that you are familiar with them throughout the year as your teacher will regularly refer back to them.

Punctuality

In order to progress well during the course, it is vital that students arrive early to all lessons, attend **ALL** lessons and complete all homework and internal assessments set. The attendance and punctuality of all sixth form students will be monitored and recorded weekly by your teacher and the KS5 Maths Co-ordinator. If you are late more than once to Maths lesson within a week your parents will receive a phone call home. Lateness to lessons causes disruption to teaching and learning of all students and will be taken very seriously.

Attendance

Unless your parents have called in that you are ill or have an appointment, you must e-mail your Maths teacher and cc Mr Alibagi (KS5 Maths Coordinator) explaining why you were absent and requesting the work missed. Your parents may receive a phone call from your teacher asking for more details. All work missed must be completed by the student prior to the next lesson. All internal assessment must be taken by all students. In the unlikely event that you miss an assessment, you will do the exam afterschool at an appointed time.

Assessment

All students are tested regularly through the course and you must record your results on the grade tracking sheet at the front of your folder. You need to have a folder, where you keep your exercise book and publication hand out given to you by your teacher. Your exercise books and folders are the best resource to help you prepare for assessments and your exams. You will be tested at the end of every half term and term. In year 12 for each unit you will do two mock exams. One of the exams is in December and one is in March (PPE's).

Homework

You are required to allocate **at least 3 hours per week** to do Maths homework. This does not include your independent study time on the subject. Homework must be recorded in your homework diary and must be done in exercise books while teaching notes should be done on papers and kept in your folder. Homework will be monitored by your Maths teacher and will be recorded centrally and will be monitored by the KS5 Maths Co-ordinator and the Head of Maths Faculty. In the unlikely event that you fail to do the homework on two occasions you will be given an hour detention afterschool with KS5 Maths Co-ordinator and will be required to complete a worksheet on the topic. However, given that you have chosen this course and have met the course requirements, we expect you to be fully committed to your own development.

Summer Bridging Work

In order to prepare you for the course we expect you to **complete the attached practice questions in the Summer** prior to the start of the course. These should be completed without a calculator, unless you see the calculator symbol next to the question. You must self-mark these with the answers provided and fill in any gaps that you have. Failure to do this will leave you in a vulnerable position and in the past this has resulted in students being unable to access the start of the course and dropping or being removed from the subject.

All year 12 students will sit a gate entry exam first week of the course. This exam will be based on the bridging work booklet and your grade will be the part of the first report that will be shared with the Sixth form leading team when discussing your suitability for the course.

Compulsory Textbooks: There is one compulsory textbook you must purchase before

- 1) **Oxford AQA Advanced Maths Level 3 Certificate Mathematical Studies. Student Book. ISBN: 978-0-19-836593-8**

NB: The textbook listed above must be purchased by all students on this course by 18/09/20

These are some useful websites:

<http://www.aqa.org.uk>

www.mymaths.co.uk

www.examsolution.co.uk

www.mathswatchvle.com

www.physicsandmathstutor.com

Scatter Diagrams

- 1) The scatter graph shows some information about the marks of six students.

It shows each student's marks in Maths and Science.

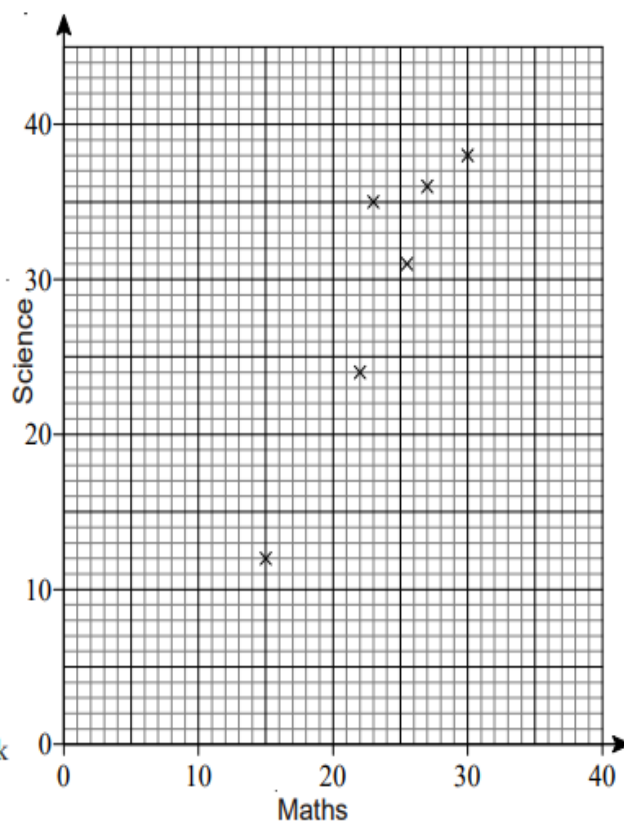
The table below shows the marks for four more students.

Maths	22	8	17	26
Science	30	12	24	24

- a) On the scatter graph, plot the information from the table.
b) Draw a line of best fit.
c) Describe the correlation between the marks in Maths and the marks in Science.

Another student has a mark of 18 in Science.

- d) Use the line of best fit to estimate the mark in Maths of this student.



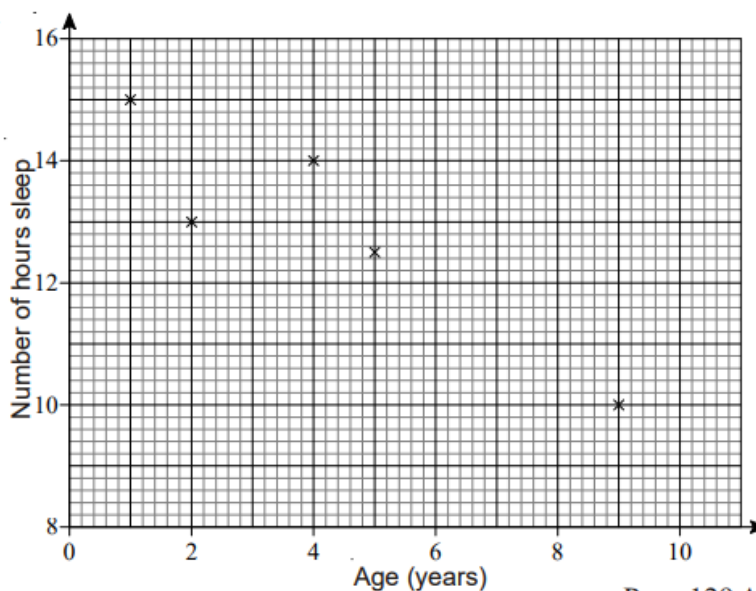
Show working out and answers

- 2) The table below shows the average daily number of hours sleep of 10 children.

Age (years)	4	2	5	1	9	6	8	7	10	1.5
Number of hours sleep	14	13	12.5	15	10	12.5	10.8	12	11	14

The first five results have been plotted on the scatter diagram.

- Plot the next five points.
- Draw a line of best fit.
- Describe the relationship between the age of the children and their number of hours sleep per day.
- Use your scatter graph to estimate the number of hours sleep for a 3 year old child.



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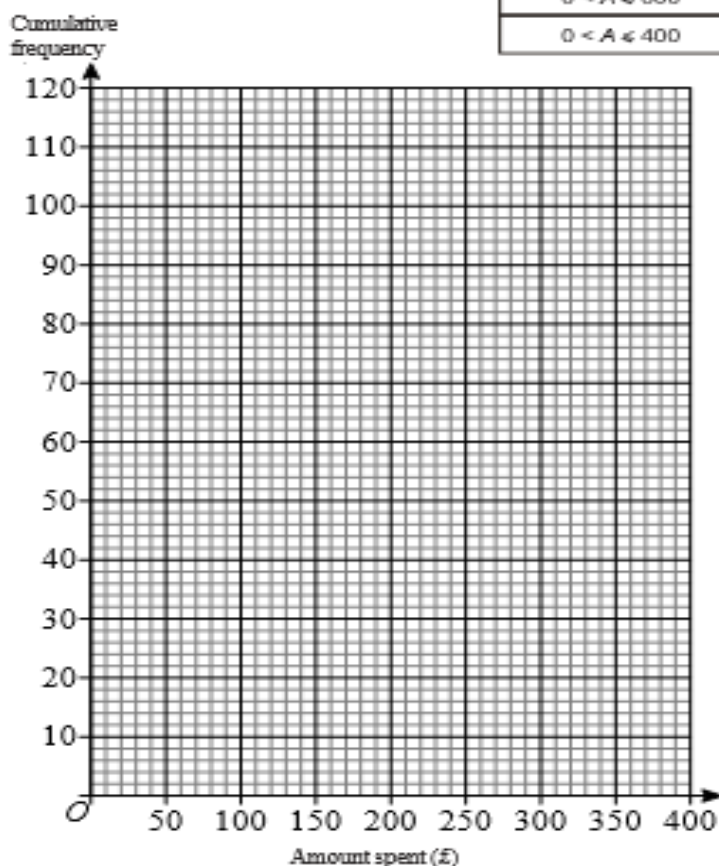
Show working out and answers.

Cumulative Frequency

Fred did a survey about the amount of money spent by 120 men at Christmas. The cumulative frequency table gives some information about the amounts of money spent by the 120 men.

- a) On the grid, draw a cumulative frequency diagram.

Amount (£) spent	Cumulative frequency
$0 < A \leq 100$	12
$0 < A \leq 150$	26
$0 < A \leq 200$	42
$0 < A \leq 250$	64
$0 < A \leq 300$	93
$0 < A \leq 350$	112
$0 < A \leq 400$	120



- b) Use your cumulative frequency diagram to estimate the median.
- c) Use your cumulative frequency diagram to estimate the interquartile range of the amount of money spent.
- d) Use your cumulative frequency diagram to estimate the number of men who spent more than £330.

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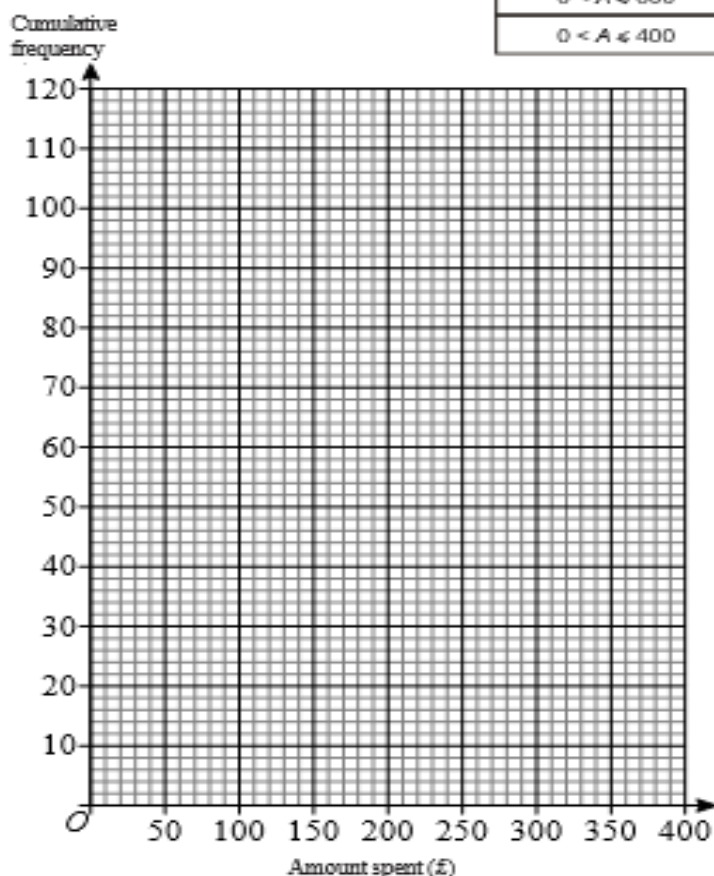
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Show working out and answers

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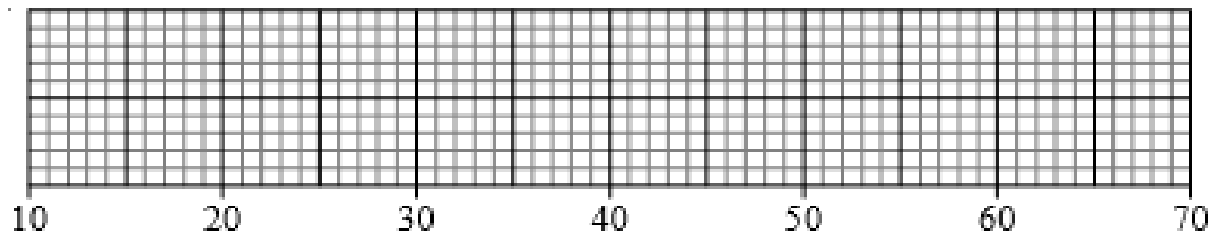
Show working out and answers

Box plot

- 1) The ages of 20 teachers are listed below.

22, 22, 24, 25, 27, 27, 28, 29, 29, 29, 34, 35, 41, 43, 44, 49, 55, 57, 58, 58

- a) On the grid below, draw a box plot to show the information about the teachers.



- b) What is the interquartile range of the ages of the teachers?

- 2) A warehouse has 60 employees working in it.

The age of the youngest employee is 16 years.

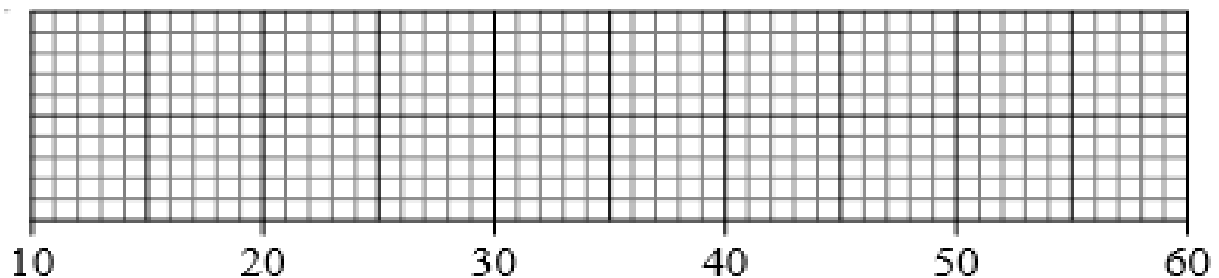
The age of the oldest employee is 55 years.

The median age is 37 years.

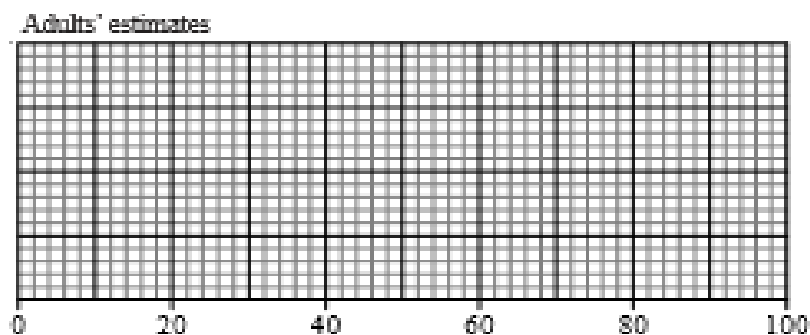
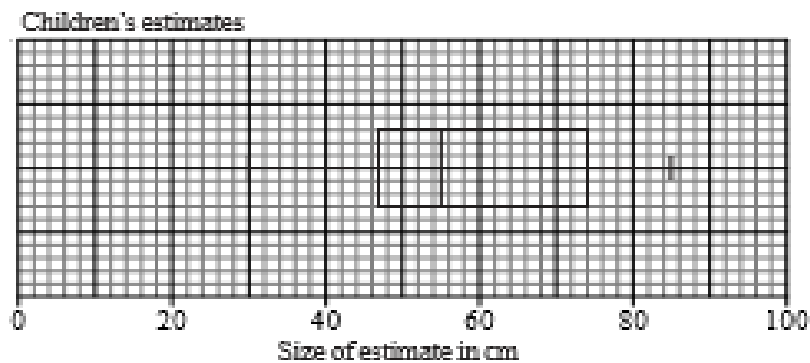
The lower quartile age is 29 years.

The upper quartile age is 43 years.

On the grid below, draw a box plot to show information about the ages of the employees.



Terry drew a line of length 60 cm.
 He asked some children to estimate the length of the line he had drawn.
 He recorded their estimates.
 The box plot gives some information about these estimates.



- Write down the median of the children's estimates.
- Write down the interquartile range of the children's estimates.

Terry then asked some adults to estimate the length of the line he had drawn.
 The table gives some information about the adults' estimates.

	Length
Lowest estimate	20 cm
Lower quartile	45 cm
Median	62 cm
Upper quartile	75 cm
Highest estimate	95 cm

- On the grid above, draw a box plot to show this information.
- Use the two box plots to compare the distribution of the children's estimates with the distribution of the adults' estimates.

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Show working out and answers

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Average from frequency table



- 1) The number of pens in each pupil's pencil case in a classroom has been counted. The results are displayed in a table.

Number of pens	Number of pupils
0	4
1	6
2	7
3	5
4	3
5	1

- a) Work out the total number of pens in the classroom.
- b) Write down the modal number of pens in a pencil case.
- c) Work out the mean number of pens in a pencil case.
- d) Work out the range of the number of pens in a pencil case.



- 2) Thomas is analysing the local football team. He records the number of goals scored in each football match in the past twelve months.

Thomas said that the mode is 7.
Thomas is wrong.

- a) Explain why:

- b) Calculate the mean number of goals scored.

Goals scored	Frequency
0	7
1	5
2	3
3	6
4	2
5	1
6	1



- 3) Sindy recorded the time, in minutes, that her train was late over 100 days. Information about these times is shown in the table.

Time (t minutes)	Frequency		
$0 < t \leq 6$	15		
$6 < t \leq 12$	23		
$12 < t \leq 18$	28		
$18 < t \leq 24$	19		
$24 < t \leq 30$	15		

Calculate an estimate for the mean time that her train was late.
Give your answer to 1 decimal place.

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Show working out and answers

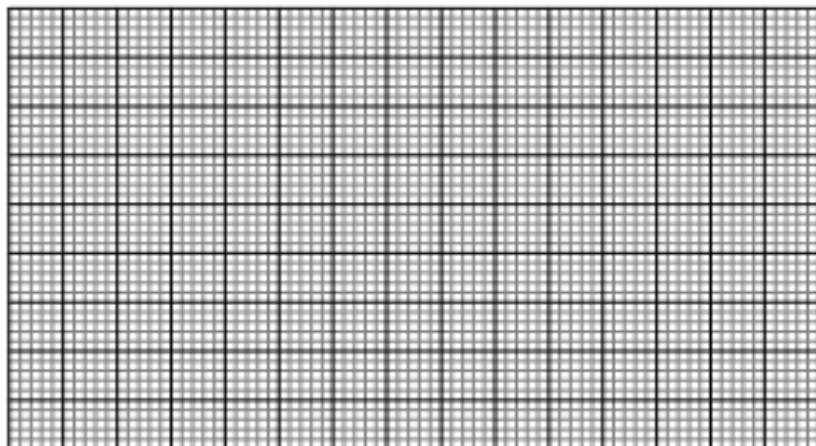
Histograms



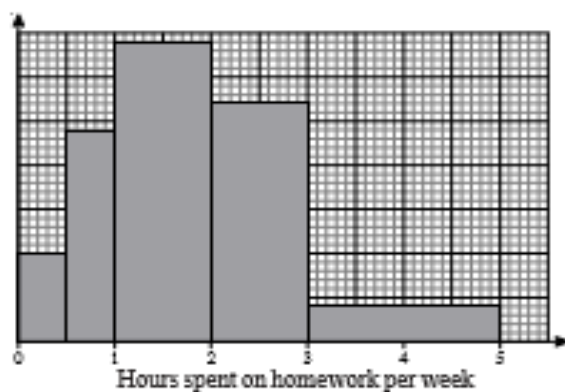
- 1) The table gives information about the heights, in centimetres, of some 18 year old students.

Use the table to draw a histogram.

Height (h cm)	Frequency
$135 < h \leq 145$	12
$145 < h \leq 165$	46
$165 < h \leq 180$	45
$180 < h \leq 190$	25
$190 < h \leq 195$	4



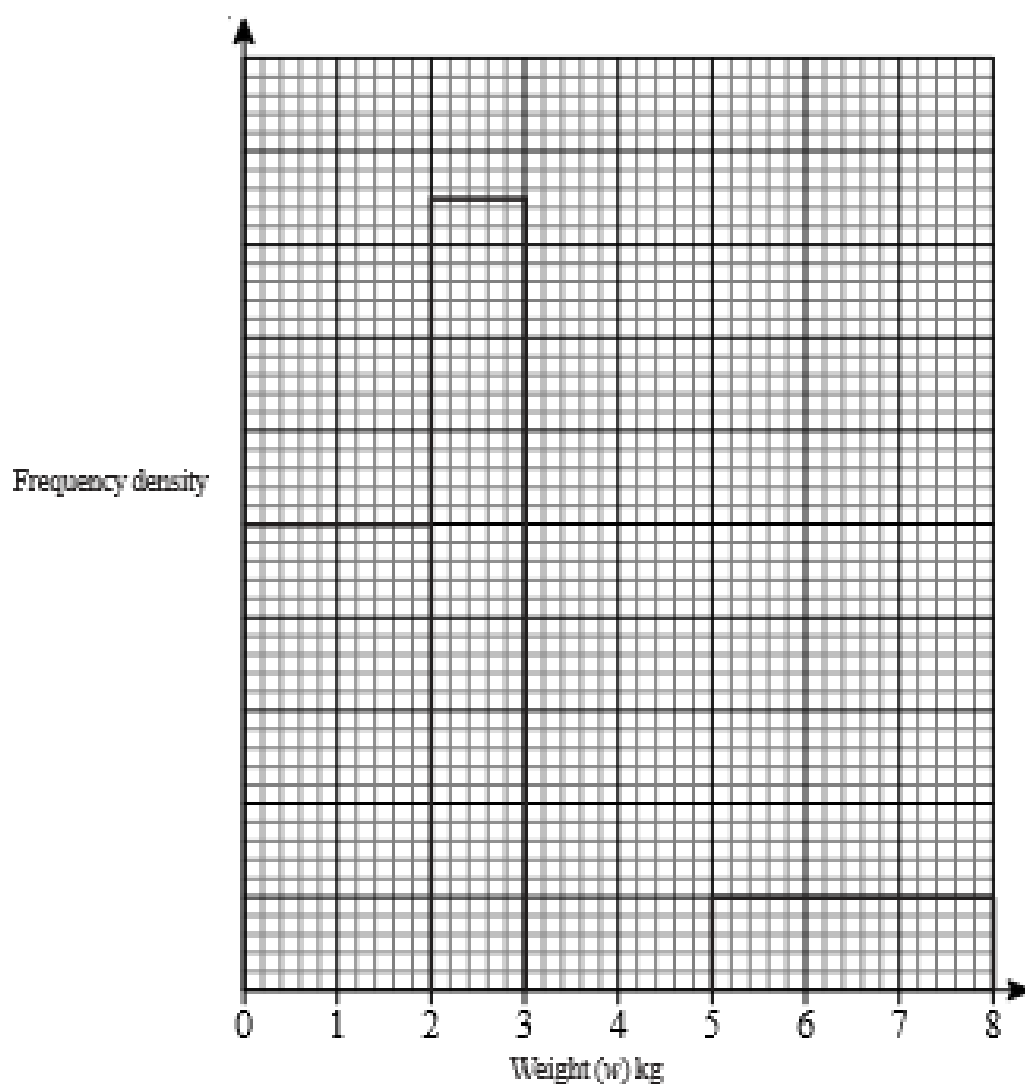
- 2) The histogram shows the amount of time, in hours, that students spend on their homework per week.



Use the histogram to complete the table.

Time (t hours)	Frequency
$0 < t \leq \frac{1}{2}$	
$\frac{1}{2} < t \leq 1$	
$1 < t \leq 2$	
$2 < t \leq 3$	27
$3 < t \leq 5$	

The table and histogram give some information about the weights of parcels received at a post office during one Thursday.



- a) Use the histogram to complete the frequency table.

Weight (w) kg	Frequency
$0 < w \leq 2$	40
$2 < w \leq 3$	
$3 < w \leq 4$	24
$4 < w \leq 5$	18
$5 < w \leq 8$	

- b) Use the table to complete the histogram.

Stratified Sampling



- 1) Ellen wants to do a survey with Years 9, 10 and 11 at her school.
The table shows the number of students in each of these year groups.

Year 11	Year 10	Year 9
750	700	900

Ellen takes a sample of 50 students stratified by year group.

Work out the number of students from Year 10 in the sample.



- 2) The table shows information about the year groups of 1000 students in a school.

Year group	7	8	9	10	11	12	13
Number in year	157	180	166	140	132	114	111

Tony takes a sample of 50 of these students, stratified by year group.

Calculate the number of Year 8 students he should have in his sample.

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Show working out here

Working with Indices

1) Evaluate the following:

a) 2^3

b) 3^2

c) 10^4

2) Evaluate the following:

a) 2^8

b) 6^4

c) 5^6

Standard Form

1) Change the following to normal (or ordinary) numbers.

a) 4.3×10^{-4}

c) 7.03×10^{-3}

b) 6.79×10^{-6}

d) 9.2×10^{-2}

2) Change the following to normal (or ordinary) numbers.

a) 4.3×10^{-4}

c) 7.03×10^{-3}

b) 6.79×10^{-6}

d) 9.2×10^{-2}

3) Change the following to standard form.

a) 360

c) 520 000

b) 8 900

d) 60000

4) Change the following to standard form.

a) 0.071

c) 0.00076

b) 0.0008

d) 0.0928

Percentage 1



1) Write the following as percentages, giving all your answers to 1 decimal place.

- a) 12 out of 34
- b) 62 out of 85
- c) 113 out of 153
- d) 2150 out of 3452



2) Sarah sat a Science test and got a score of 64 marks out of 112 possible marks.

What was her mark as a percentage?

Give your answer to 1 decimal place.



3) In a class of 32 students, 18 of them are boys.

What percentage of the class are boys?

Give your answer to 1 decimal place.



4) In a French class there are 13 girls and 6 boys.

What percentage of the class are girls?

Give your answer to 1 decimal place.

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Show working out for questions 2,3 and 4 here.

Percentage 2

- 1) Acomputer costs £460 plus VAT at 20%. Work out the total cost of the computer.

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- 2) A car is usually priced at £9800 but now has a discount of 8%. What is the price of the car?

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3) 9500 people attended a festival and 22% of them are children. How many children are there at the festival?

Answers

Scatter Diagrams

Q1.

- a) b) c) Positive d) 16

Q2

- a) b) c) Negative d) 13.5 hours

Cumulative Frequency

- a) b) £240 c) £140 d) 14

Cumulative Frequency

- a) 17,40, 76, 90, 98, 100 b)
b) 46 d) 40

Box plot

Q1 a) b) 19.5

Q2 16, 55, 29, 37, 47

Box Plot

- a) 55 cm b) 27 cm c) d) 55, 62 and 30,27

Average from the table

Q1.

- a) 52 b) 2 c) 2 d) 5

Q2.

a) Median=0

b) 48/25

Q3. 14.8

Histograms

a) 34,12 FD: 20,34,24,18,4

Histograms

Q1. FD: 1.2, 2.3, 3, 2.5, 0.8

Q2. Frequencies: 20, 48, 34, 8 F.D: 10, 24, 34, 27, 4

Stratified Sampling

Q1. 15

Q2. 9

Working with indices

Q1. a) 8 b) 9 c) 10000

Q2. a) 256 b) 1296 c) 15625

Q3. a) 25 b) 17 c) 14

Standard Form

Q1. a) 43000 b) 6790000 c) 7030 d) 920

Q2. a) 0.00043 b) 0.00000679 c) 0.00703 d) 0.092

Q3. A) 3.6×10^2 b) 8.9×10^3 c) 5.2×10^5 d) 6×10^4

Q4. a) 7.1×10^{-2} b) 8×10^{-4} c) 7.6×10^{-3}

Percentage 1

Q1. a) 33.3% b) 72.9% c) 73.9%

Q2. 57.14% 57.1%

Q3. 56.25% 56.2%

Q4. 68.42% 68.4%

Percentage 2

Q1. £487.20

Q2. £9016 Q3. 2090